Office Ergonomics

5th Edition

Prepared by the Canadian Centre for Occupational Health and Safety

Emergency Information

Ambulance

Fire

Police

Poison Control Centre

Doctor

Company Emergency Phone Number

Prepared by

Canadian Centre for Occupational Health and Safety
Hamilton, Ontario, Canada

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104-05938/

Office Ergonomics Safety Guide

5th Edition

Canadian Centre for Occupational Health and Safety

Published 2002

P02-4E
ISBN 0-660-18977-1
DSS Catalogue Number CC273-2/02-4E

Canada $10.00 (+GST)
US/Other $10.00 (USD)
(Prices subject to change without notice)

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Office Ergonomics Safety Guide

Objectives

This guide will enable you to:

- develop an understanding of the basic elements of office ergonomics;
- identify tasks that can potentially cause work-related musculoskeletal disorders (WMSD) and other injuries to the muscles and joints;
- develop an ergonomics program and set goals for your workplace; and
- focus on problem solving through employee and management involvement.

Scope

This guide is applicable to office work and covers factors that contribute to compatibility between workers and office work. It covers ergonomic aspects of the workstation, work organization, the work environment and recommended safe work practices.

This guide will assist in the development and implementation of office ergonomics programs. For employee training sessions, it is a practical handout for participants.

Target Audience

This guide is for managers, supervisors, workers, people working from their homes, occupational health nurses, occupational therapists, chiropractors, health and safety representatives and health and safety professionals.

Summary

Ergonomics deals with the compatibility between workers and their work. "Work" is made up of the work environment, workstations, and tasks. Poor ergonomic conditions exist when the "work" is incompatible with the workers' bodies and their ability to continue working. Such conditions may cause discomfort, fatigue and pain and, subsequently, injury.

Injuries resulting from poor ergonomic conditions are collectively known as musculoskeletal injuries (MSI), repetitive strain injuries (RSI) or repetitive motion injuries (RMI) or work-related musculoskeletal disorders (WMSD). The causes of these injuries are prolonged work involving repetitive movements, forceful movements and awkward body postures. WMSD are painful and often disabling injuries which affect mainly the wrists, back, legs, shoulders, neck, muscles and joints.

Adequate environmental conditions are important for the overall well-being of workers and productivity. When the work area is too cold or too hot, poorly lit, noisy, poorly ventilated, or contains unpleasant odours it results in annoyance, stress, fatigue, eye strain, headache and other conditions.

Injuries and illnesses related to poor ergonomic conditions can be prevented by making the workplace and the work organization fit the physical and mental ability of each individual worker.

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Introduction

Work-related musculoskeletal disorders (WMSD) are the most commonly occurring hazards in modern offices. These injuries result from poorly designed workstations, and inadequate job design.

Two common types of WMSD are muscular strain in the neck, shoulders and back, due to prolonged sitting; and injury to joints and muscles due to excessive repetition of movements. Injuries due to repetitive movement are known as repetitive strain injury (RSI), repetitive motion injury (RMI), musculoskeletal injuries (MSI) and work related musculoskeletal disorders (WMSD). In this guide we will use the term WMSD to describe such injuries.

The following table summarizes common ergonomic and safety hazards in office work.

Ergonomic and Safety Hazards in Office Work

Hazard Type	Causes	Prevention
rgonomic Hazards		
e strain/ eadaches	• poor lighting • glare/flicker on screen • awkward posture	• adequate lighting • proper workstation design • equipment maintenance
rk-related nusculoskeletal isorders (WMSD)	• repetitive tasks • poor posture/incorrect seating • poorly designed workstations • Incorrectly sited VDTs, work equipment	• proper work station • adequate job design • comfortable work environment
ck ache/strain	• improper manual material handling techniques • awkward posture	• training in proper lifting procedures • proper chairs and workstations • scheduled breaks
afety Hazards		
ps, slips, falls sprains, strains, ractures	• cluttered floors • slippery patches • trailing cables • improperly stored materials • open cabinets, drawers and doors	• good housekeeping • proper workplace layout • safe work practices
ts and abrasions	• poorly designed office equipment • sharp edges on furniture/equipment	• properly designed tools and equipment
rns/electric shock	• faulty wiring, poorly wired electrical equipment • electric heaters • static electricity build-up	• electrical safety training • routine safety checks • safe handling procedures • grounding

Ergonomic Hazards in the Office Workplace

1. What is Ergonomics?
2. What are WMSD?
3. Why is There So Much Commotion about Ergonomics?
4. What are the Common Symptoms of WMSD?
5. How do Work-related Musculoskeletal Disorders (WMSD) Occur?
6. How do WMSD Affect our Body?
7. What to Do if You Notice Symptoms of WMSD
8. How are WMSD Treated?

1. What is Ergonomics?

The word ERGONOMICS is made up of two Greek words: "ERGOS" (WORK) + "NOMOS" (NATURAL LAWS)

In simple words, we can define ergonomics as the science of matching the work (job) to the worker.

Office ergonomics includes workstation design, job design and work environment.

A workstation that does not match the worker's shape, size and capabilities may hinder the task performance. A poorly designed workstation may pose undue physical stress on the worker due to awkward posture, application of force, repetitive movements, or a combination of these factors. Prolonged work in such conditions can result in injuries of the wrists, back, neck, shoulders and elbows in particular; and muscles, joints and nerves in general. Such injuries are known by many different names. In this guide we will use the term WMSD (Work-related Musculoskeletal Disorder) for such injuries.

The economic consequences of poor ergonomic conditions include poor work quality and productivity, and increased worker's compensation cost due to lost time and disability.

2. What are WMSD?

Work-related musculoskeletal disorders (WMSD) are injuries that involve muscles, and tissues connecting bones, namely tendons and ligaments. Two types of WMSD affect office workers:

1. Prolonged stationary positions resulting in
    - neck ache;
    - back ache.
2. Combination of awkward posture, repetitive motion, and application of force in an awkward posture resulting in
    - pain in the wrists and hands;
    - shoulder pain.

WMSD are also called Overuse Syndrome, Over-Exertion Injury, Repetitive Strain Injuries (RSI), Musculoskeletal Injuries (MSI), and Repetitive Motion Injuries (RMI). These different names are used to emphasize the fact that these injuries result when a given part of the body is subject to prolonged strain while performing a task.

Depending on the nature of the job, the most frequently affected parts of the office worker's body are the torso, including the lower back, shoulders, neck, arms and wrists.

For reasons not fully understood, carpal tunnel syndrome (CTS) has become synonymous with all WMSD suffered by office workers operating computers. In reality, carpal tunnel syndrome is considered a relatively rare medical condition.

3. Why Is There So Much Commotion about Ergonomics?

Office work presents risks of WMSD due to:

- fixed and constrained postures that are frequently awkward, and maintained for too long;
- repetitive hand movements, and
- high pace of movements that does not allow sufficient time for recovery from the effects of these movements.

Office ergonomic hazards are related to workstation design, job design, repetitive motion, posture, vision, thermal conditions, noise, safety and job design. Long periods (months to years) of work in poorly designed workplaces increase the risk of WMSD.

In recent years, reported cases of wrist injuries and back disorders have been constantly increasing. Many of these injuries are serious and require prolonged medical treatment, and often surgery. In the workplace, such injuries have resulted in lost productivity and quality, as well as increased costs from lost days and disability compensation.

4. What are the Common Symptoms of WMSD?

WMSD primarily affect the hands, wrists, shoulders and arms.

The following are some of the warning signs:

- pain: burning or aching;
- fatigue;
- tingling, numbness;
- loss of grip, clumsiness;
- stiffness: difficulty in closing or opening door knobs; or
- reduced control or coordination of body movements;
- hypersensitivity: tenderness to the touch.

Different types of WMSD are known by many different names depending on the type of injury and affected body part. The following table summarizes symptoms of some common injury types.

Musculoskeletal Injuries

Type of Disorder	Symptoms
Back disorder	Pain in the back, difficulty in turning, bending and moving the back.
Carpal tunnel syndrome (CTS)	Compression of the median nerve as it enters the palm of the hand through the "carpal tunnel". The symptoms are pain and numbness in the index and middle fingers and weakness of the abductor muscles of the thumb.
Tendonitis	Pain mainly in the hands and wrist due to inflammation of the tendon as a result of overuse. Tendons are fibre bundles that attach muscles to bones.
Tenosynovitis	Pain due to inflammation of the tendon sheath, producing pain and swelling. It may result from loss of lubricating system of the bone joints as a result of repetitive and excessive hand movement.
Thoracic outlet syndrome	Pain, arm weakness, and numbness in the arms and fingers as a result of the squeezing of the nerves and blood vessels between the neck and shoulders.
Bursitis	Restriction and pain in joint movement as a result of deficient lubrication at a bone joint, for example at the shoulder.

Pain

In the early stages of injury, discomfort is the main symptom. As conditions persist, the injury continuously worsens, leading to severe impairment and disability.

Pain is the most common symptom of WMSD. The pain can range from mild discomfort to unbearable agony and may not be confined to the site of injury. It can spread upwards, sideways and downwards from the site of the injury.

Early Stage of Pain: The body aches and one feels tired at work, but symptoms disappear during the time away from work. The injury does not interfere with the ability to work. The injury will heal completely if dealt with properly at this early stage.

Intermediate Stage of Pain: The injured area aches and feels weak soon after start of work until well after work has ended. The injury will still heal completely if dealt with properly.

Advanced Stage of Pain: The injured area aches and feels weak even at rest. Sleep is affected. Even light tasks are very difficult to perform.

5. How do Work-related Musculoskeletal Disorders (WMSD) Occur?

The following are the three main causes of WMSD:

Repetition: *Work activities performed with high rate of repetition.*

Force: *Work activities which require application of excessive muscle force for a long time.*

Posture: *Work activities which require maintaining fixed awkward postures for a long time.*

Repetitive movements are one of the leading risk factors for WMSD, especially when such movements involve the same joints and muscle groups. There are no standardized rules to judge the degree of repetitiveness of a task. Keyboarding, mouse operation and data entry are examples of repetitive movements in office work.

Movements are forceful when substantial physical effort is required to perform a task. The amount of force we use depends on many factors, such as the weight of the objects to be lifted and their placement in relation to the body. We have to use more force to lift and carry a box if our arms are outstretched and the object is held away from the body. Also, we have to use more force to lift the same object in a "pinch" position than in a "hook" position.

Fixed or awkward body positions can cause discomfort and fatigue if they are maintained for long periods of time. Everyone is familiar with the discomfort associated with sitting rigidly for too many hours.

The following are some examples of awkward body positions:

- working with the torso bent forward, backward or twisted;
- reaching above shoulder level;
- bending the wrist forward, backward, or side to side; and
- fixed position of the neck and the shoulders when performing controlled arm movement.

Keyboard work is a common type of office work requiring repetitive movement. Inadequate workstation design may require a fixed awkward body position or an awkward wrist position, thus contributing to all the above sources of WMSD risk.

Awkward wrist positions

Duration of work is an important factor. Work-related Musculo-skeletal Disorders develop slowly and are usually noticeable only after weeks, months, or years of work involving overuse of muscles, tendons, nerves and joints. Injury as the result of a single accident does not cause WMSD. For example, slipping on a wet floor could cause a sprain but this injury would not be called WMSD.

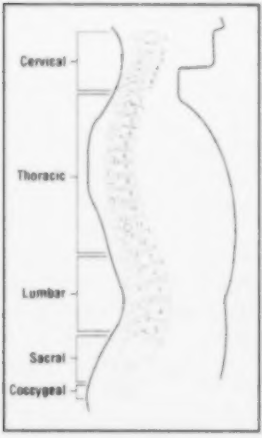
6. How do WMSD Affect our Body?

We can group WMSD in four categories:

- joint injury;
- muscle injury;
- tendon injury; or
- nerve injury.

Joint Injury

A joint is the connecting point for two or more bones. Joints are of three types: (i) freely movable, (ii) slightly movable and (iii) immovable. The elbow, shoulder and spine are examples of joints. At the joint, the opposing surfaces of the bones are lined with flexible tissue called cartilage, made up of fibrous tissues and soft tissues. Cartilage provides a smooth surface for movements.



The spinal column – a series of many joints

The shoulder, elbow and wrist joints

As a result of repetitive forceful movements of joints, the cartilage softens, and some of its fibres separate. The normally smooth cartilage becomes pitted and frayed, and whole segments of cartilage may be lost. Bony outgrowths form, which interfere with the movement of joints. These changes interfere with the joint movement and can cause severe pain. These changes also mark degenerative joint disease or osteoarthritis.

Muscle Injury

Muscles provide the force to perform a task. For every movement, the muscles squeeze together, or contract, and then relax.

When we do prolonged work in a sitting position, our muscles are contracted for too long. When we use a keyboard or mouse our muscles are contracted with little chance to relax. This causes reduced flow of blood to the muscles. As a result, the chemical by-products (waste substances produced by the muscles) are not removed fast enough, and they build up. The accumulation of these substances causes muscle irritation, injury and pain.

If the muscle is allowed to rest and recuperate, repair of the muscle injury occurs and the pain disappears. However, if damage repetitively occurs every day for months and years, the muscle is not able to repair the damage as fast as it occurs. As a result, long-lasting or permanent injury will develop.

Tendon Injury

Tendons are fibre bundles that attach muscles to bones. Tendons are elastic and flexible; they assist in concentrating the pull of the muscle on a small area of the bone. Some tendons are surrounded by tendon sheaths which

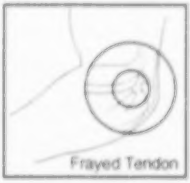
are tubular double layered sacs containing synovial (lubricating) fluid.

Tendon injuries occur as a result of repetitive or frequent work activities and awkward postures. These injuries affect mainly the hand and wrist and also the shoulder, elbow and forearm.

Tendonitis

When a tendon is repeatedly tensed, some of its fibres can be torn apart. The tendon becomes thickened and bumpy, causing inflammation, tenderness and pain. Tendonitis is the general term indicating inflammation of the tendon.

Tenosynovitis



The inner walls of the sheaths surrounding tendons contain cells that produce a slippery fluid which lubricates the tendon. With repetitive or excessive movement of the hand, the lubrication system may malfunction. It may not produce enough fluid, or it may produce a fluid with poor lubricating qualities. Failure of the lubricating system creates friction between the tendon and its sheath, causing inflammation and swelling. The inflammation of the tendon sheath is known as tenosynovitis.

Ganglion Cyst

An inflamed tendon sheath may swell up with lubricating fluid. This causes a bump under the skin called a ganglion cyst.

Bursitis

In some parts of the body, such as the shoulder, tendons pass through a narrow space between bones. A sac called a bursa lies between the tendons and

the bones. The bursa acts as an anti-friction device. Repeated stretching or squeezing of the bursa causes inflammation known as bursitis.

Nerve Injury

Nerves carry signals from the brain to control muscle activity. They also carry information about temperature, pain, and touch from the body to the brain and control bodily functions such as sweating and salivation.

Nerves are surrounded by muscles, tendons, ligaments, and blood vessels. With repetitive motions and awkward postures, the tissues surrounding nerves become swollen, and squeeze or compress nerves.

Two common types of WMSD that affect the nerves are:

- thoracic outlet syndrome;
- carpal tunnel syndrome.

Thoracic Outlet Syndrome

Blood vessels and nerves

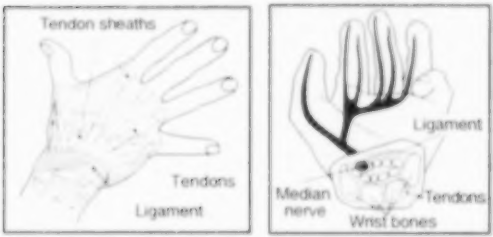
Thoracic outlet syndrome is caused by squeezing of the nerves and blood vessels between the neck and shoulders.

Work involving prolonged restricted posture such as carrying heavy shoulder loads, pulling shoulders back and down, or reaching above shoulder level can cause the swelling of tendons and muscles in the shoulders and upper arms. When swollen, they can squeeze the nerves and blood vessels between the neck and shoulders.

The symptoms of thoracic outlet syndrome include pain, arm weakness, and numbness in the arm and fingers. In some cases, the sense of touch or the ability to feel heat and cold may be lost.

Carpal Tunnel Syndrome

Carpal tunnel syndrome is a disorder of the wrist. The carpal tunnel is a channel through the wrist (carpal) bones. The carpal tunnel is a passageway for blood vessels, tendons, and the median nerve as they pass from the arm into the hand.



The median nerve controls the action of the hand, thumb, index and middle fingers. Also, the median nerve transmits sensations of hot, cold, pain and touch to and from the hand and fingers.

Causes

Carpal tunnel syndrome is caused by jobs involving repeated bending, twisting, pinching, grasping, strong gripping and the use of vibrating tools. Some common examples of such jobs are: typing and computer keyboard work, cashier, assembly work, carpentry, brick laying, sanding, butchery, and housekeeping.

Symptoms

The symptoms of carpal tunnel syndrome are:

- pain in the wrist;
- numbness, tingling, burning sensations in the wrist and hands;
- difficulty in movement of fingers and hand;
- difficulty in gripping things; and
- pain in arm and shoulder.

Prevention

- position hand and wrist comfortably;
- use two hands instead of one hand;
- reduce repetition (e.g. vary tasks);
- use ergonomically designed tools;
- maintain tools in good working condition to avoid need for excessive force;
- wear gloves and use tool handles with good grip; and
- ask your doctor or therapist for hand exercises.

Treatment

Prompt treatment can prevent further damage and relieve symptoms of carpal tunnel syndrome. Types of treatment include rest, use of pain killers, and splints for hand and wrist. In very serious cases, surgery may be required.

Back Injury

Back pain is a common condition among working adults. Some people get back pain off and on. The time between episodes of pain could be several days or months. There are also people who experience a dull ache in their back all the time.

Causes

Work-related causes of back pain are:

- poor workplace design;
- poor body posture;
- lifting and handling heavy loads;
- forceful exertion, bending, twisting, etc.;
- working in a stooped position;
- prolonged sitting in a fixed position;
- psychological stress;
- inadequate rest periods (repetitive work); and
- poor fitness level.

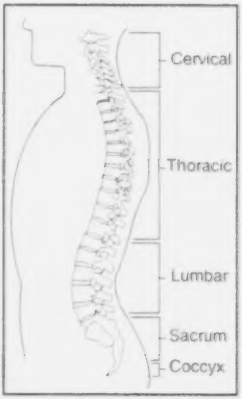
Work-related back pain develops gradually. For example, heavy lifting may result in cumulative damage to the spine over a period of time. The time at which the injury actually occurs may be just a matter of chance.

Symptoms

Common symptoms of back pain include the following:

- feeling of "tight band" across the lower back;
- pain while working in bent position;
- pain and stiffness when getting up in the morning or when sitting or standing for long periods;
- difficulty in straightening the back when standing;
- sudden intense pain in the lower back causing difficulty in moving from one place to another; and
- back pain spreading to the thighs and lower leg with tingling and numbness in the foot and toes.

Prevention of Back Injury



Posture

- Use good body posture. Maintain your back's natural curves.

Lifting

- Lift by holding the load close to the body.
- Follow lifting guides. (See page 39)

Reaching

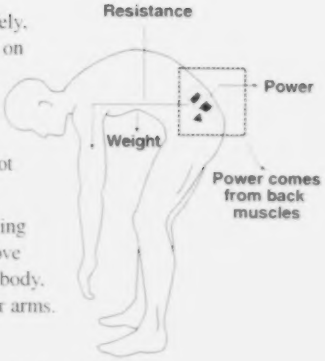
- Don't overstretch yourself. Reach only as high as is comfortable for you.
- Use a stool or ladder if you need it.
- When reaching down, support your body with one arm.

Working in a standing position

- Place one foot on a low stool to balance your body.
- Keep your knees slightly bent, pelvis tilted forward.

Bending

- To bend safely, kneel down on one knee.
- Bend your hips and knees and not your back.
- When reaching forward, move your whole body, not just your arms.



Sitting

- Adjust chair height so that the thighs are horizontal and the feet rest comfortably on the floor.
- Maintain straight posture. Slouching puts pressure on the back.
- Adjust chair-desk combination to position the work at elbow height for writing and keying tasks.
- If the desk is too high when the chair is correctly adjusted, raise the chair and use a foot rest to correctly position the feet.

7. What to Do if You Notice Symptoms of WMSD

People who notice symptoms of MSI or suspect that they may have an WMSD should see a physician immediately. Diagnosis of work-related Musculoskeletal Disorders is confirmed by performing laboratory and electronic tests that determine the degree of nerve or muscle damage. Self-diagnosis and self-treatment of WMSD is not advisable.

At the same time, report the condition to your manager/employer and the Joint Health and Safety Committee. They will explore the feasibility of adjusting your workstation, equipment and work environment to help alleviate the problem.

8. How are WMSD Treated?

Always seek medical advice before starting treatment. Treatment procedures may include the following:

- restriction of movement;
- application of heat and cold;
- physiotherapy; or
- medication and surgery.

Restriction of Movement

The first approach is to reduce or avoid the activities causing the injury. This may require work restrictions and in some cases, transfer to a different job.

In some circumstances, a splint can also be used to restrict movements or to immobilize the injured joint. However, the use of splints requires extreme caution. If used inappropriately, splints can cause more damage than good. For example, a splint may transfer stress to another joint.

The long-term solution is job redesign to avoid extreme load on the joints.

Application of Heat and Cold

Applying heat or cold seems to relieve pain temporarily and may accelerate the repair process. Ice reduces pain and swelling. Ice or cold packs can be applied on the injured area for ten to fifteen minutes every two or three hours for up to two days. Excessive use of ice may damage skin and nerves.

Heat is not recommended for injuries with significant inflammation and swelling. Heat increases the flow of blood and increases swelling.

Heat can be applied on the injured area after the swelling has subsided. At that point, heat can speed up healing, help relieve pain, relax muscles, and reduce joint stiffness.

Consult your doctor before applying heat or cold.

Exercise

Exercises restores strength and movement to an injured body part. Consult a physiotherapist or occupational therapist before exercising. Exercise programs can aggravate the existing condition if not properly designed.

Medication and Surgery

Medical treatments of WMSD range from pain killers to surgery. However, it is important to remember that if you return to the same, unmodified job following treatment or surgery, the WMSD will likely occur again and probably more severely.

Section II

Office Ergonomics Program

1. What is an Office Ergonomics Program?
2. How to Identify Ergonomic Hazards
3. How to Control Ergonomic Hazards
4. Ergonomic Aspects of Visual Display Terminals
5. Office Safety
6. Exercises to Do in the Office
7. Education and Training

1. What is an Office Ergonomics Program?

An office ergonomics program is a systematic approach and a management system to reduce risk from ergonomic hazards. The program must:

- have the support of senior management;
- carry the signature of the highest authority;
- clearly state its objectives and rationale;
- give the steps to be followed and their sequence; and
- assign authority, responsibility and deadline for each step.

An office ergonomics program includes the following basic components:

- hazard identification; worksite evaluation;
- implementation of solutions; improving workplace conditions and work practices;
- training and education of employees; empowering employees to work safely;
- evaluation of the effectiveness of solutions; and
- continuous improvement of the program for better results.

There is no universal ergonomics program that applies to all workplaces. A suitable program is one which is tailored to meet specific needs of a particular workplace by taking into account production requirements, staff capabilities and the risk of losses due to WMSD.

Comment: Know who your department contact for ergonomic issues is. Notify your supervisor if you have ergonomic concerns.

2. How to Identify Ergonomic Hazards

The recognition of ergonomic hazards is important to their prevention. This involves identifying conditions and practices where improvements need to be made.

The hazard recognition process should be coordinated by a team. The members of the team should be representatives of management and workers, health and safety specialists, and engineers, if feasible.

Hazard recognition is an ongoing process. It includes the following steps:

1. Find existing or potential WMSD problems at their earliest stages. A good strategy entails, among other things, the use of health surveys and checklists.
2. Ask people specific questions about their health as it relates to their work. (See Appendix A1 for a sample Ergonomics Survey Questionnaire).
3. Repeat a health survey every six months or annually, to monitor whether the WMSD situation is getting better or worse. This is especially important if changes have been made to reduce the risks of WMSD. (See Appendix A2).
4. Use checklists to help identify the features in jobs and workplaces that are potential risk factors for WMSD. (See Appendix A3 for a sample checklist). A checklist may not cover all the problems encountered, but will provide a basis for action. Customize existing checklists to meet the specific needs of different jobs and workplaces.

3. How to Control Ergonomic Hazards

The most important risk factors that contribute to ergonomic hazards (risk of WMSD) are:

- workstation design;
- working in a standing position;
- work organization;
- tools, equipment, furniture design;
- manual material handling;
- work environment; and
- lighting and vision.

Workstation Design

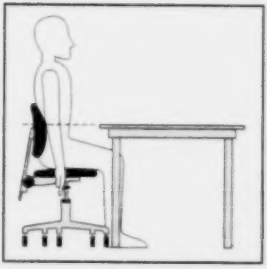
Workplace design includes:

- work surface (desks);
- seats (chairs);
- accessories, and;
- workstation layout; and
- working space.

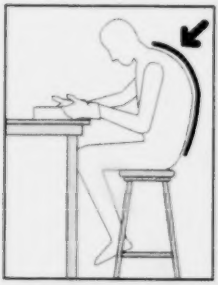
Work Surface

The work surface is the desk, table or bench that an individual works at. If the work surface is too high or too low for the body and the task being done, then the individual is required to perform the tasks in an awkward body position.

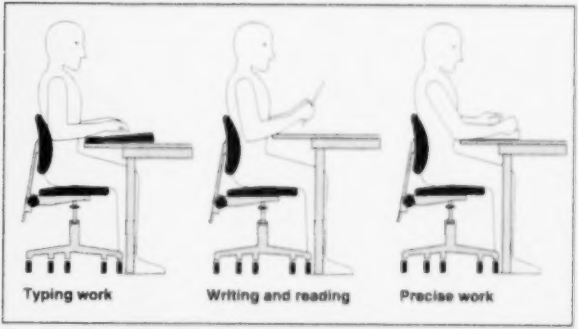
The chair and/or work surface height should be adjusted properly to suit the individual and the type of work.



Good body position



Awkward body position



For typing and keyboarding, the work surface should be about the height of the elbows with the arms hanging straight by the sides.

For writing and reading the work surface should be about 5 cm above elbow height.

If the work surface is not adjustable, then the seat height should be adjusted so that the elbows are about the same height as the top of the work surface.

The thighs should be horizontal. If the feet are not resting flat on the floor, use a footrest.

☑ MAKE adjustments so work surface is at the correct working height.

ENSURE that work surface is large enough to hold materials.

AVOID cramping legs under work surface.

AVOID over-reaching and twisting.

STORE frequently used items in the most convenient places.

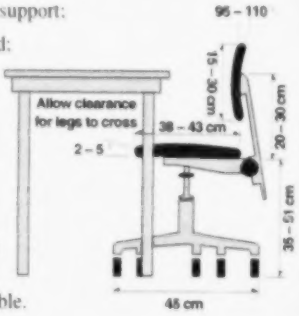
☒ DO NOT STORE materials under work surface.

Seat (chair)

The seat should enable an individual to work without using awkward body positions or forceful movements. A good seat has the following qualities:

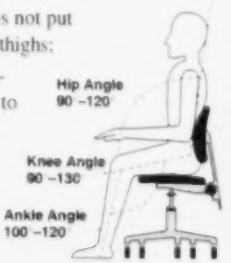
- provides back support;
- can be adjusted;
- can get close to the work surface; and
- moves easily.

To encourage good body positions, the height of the seat and the slope of the back rest should be adjustable.



☑ CHOOSE a chair with:

- adjustable height, seat, arm rest and back rest;
- five castors for easy movement;
- a backrest which is shaped to support the lower back and does not give way;
- a seat height which does not put pressure on back of the thighs;
- a seat that curves downwards at the front edge to prevent pressure on the back of legs;
- a stable base;
- a swivel mechanism so that twisting can be avoided;
- arm rests which do not prevent the chair from being drawn up to the desk or interfere with natural movement; and
- a non-slip breathable seat fabric.



TIGHTEN the chair backrest so that it does not give way with body weight.

ADJUST the chair to suit your height and your workstation height.

To adjust a chair and work surface:

STAND in front of the chair. Adjust the height so the highest point of the seat is just below the knee cap.

SIT so that the clearance between the front edge of the seat and the lower part of the legs just fits a clenched fist.

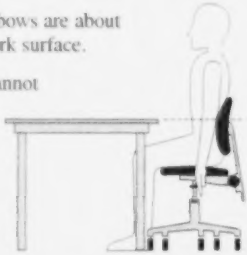
ADJUST the backrest of the chair so that it supports the hollow of the lower back.

ADJUST work surface to about the height of elbows with the arms hanging straight by the sides.

RAISE the chair to get the proper arm and upper body position when using a fixed height work surface.

ADJUST chair height so elbows are about the same height as the work surface.

USE a footrest if the feet cannot rest flat on the floor or if there is pressure on the back of the legs. The footrest should be adjustable and support the whole foot.



Alternative Chairs

The forward sloping chair and the kneeling chair are alternatives for workers who sit continuously.

Forward Sloping Chair

These chairs include a mechanism that tilts the seat pan forward 5° to 10°.

Advantages

- Increases the number of possible positions.
- Provides better alignment for spine.
- Improves visual distance and angle to the task on work table.
- Improves head position.
- Decreases pressure on internal organs.

Disadvantages

- May exaggerate lumbar curve of the spine.
- Places more weight on legs and arms to control forward tilt of the upper body, and may result in earlier development of fatigue.
- May cause clothing to ride up legs.
- May cause the body to slide forward.

Kneeling Chair

These chairs include fixed seat sloping at 30° forward and padded support for knees.

Advantages

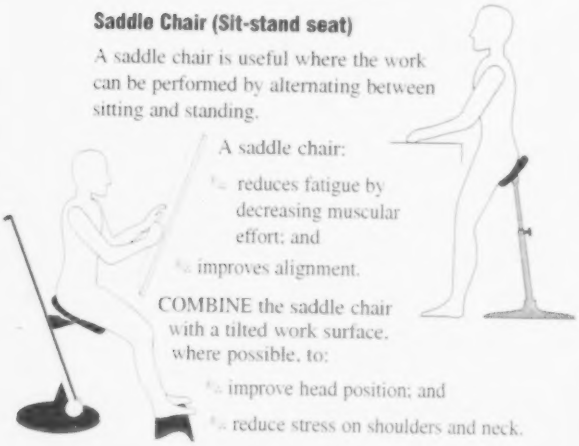
- Provides proper alignment for the spine.
- May be good for some people if fitted to the individual.
- Provides considerable comfort for short periods of time.

Disadvantages

- Causes shins to bear weight.
- Over-flexes knees and ankles.
- Limits the number of possible sitting positions.
- May cause fatigue to develop sooner.
- May cause clothing to slide up legs.
- Makes getting in and out of the chair inconvenient.
- Reduces the range of reaches.

Saddle Chair (Sit-stand seat)

A saddle chair is useful where the work can be performed by alternating between sitting and standing.



A saddle chair:

- reduces fatigue by decreasing muscular effort; and
- improves alignment.

COMBINE the saddle chair with a tilted work surface, where possible, to:

- improve head position; and
- reduce stress on shoulders and neck.

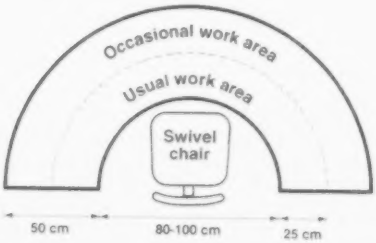
Accessories

Accessories include foot rests, foot rails, arm rests, and wrist rests. These accessories are intended to support our feet, legs, arms or wrists. For example, a foot rail or a portable foot rest would allow us to change body position and shift the weight of the body from one leg to the other, if working in a standing position.

Poorly designed, improperly adjusted accessories may not provide support. As a result, we may use awkward body positions.

Workstation Layout

☑ ARRANGE work in a semi-circle.
POSITION tasks within easy reach.



USE a swivel chair:

- to reduce body twisting;
- to allow easy movements; and
- to reduce side-to-side motions.

USE sloping work tables wherever possible:

- to reduce bending; and
- to encourage an upright position while sitting or standing.

Working Space

When the spatial arrangement of the work space is being planned, two main aspects of human behaviour have to be addressed – "territoriality" and "personal space".

Both territoriality and personal space play an important role in workers' overall feelings of comfort. Depriving people of these two "shieding" factors by overcrowding, contributes to stress and alienates people from their work and social environment.

The space allocated to work should encompass more than merely the dimensions of the workstation. It should also allow a person to move around freely and permit

interpersonal contact without forcing one person to invade another's personal space.

Conventional Organizational	Landscaped Offices	Offices
	in square meters (square feet)	
Executive	28-45 (300-500)	35 (400)
Middle-management Supervisor	9-28 (100-300)	7.5-22 (80-244)
Clerical and support staff *	5.5-7 (60-75)	4 (45)/minimum

Source: CCOHS

* These guidelines, however, do not take into account the human psychological need for space, and for that reason it may be suitable for the lower values for clerical and support staff to be increased by a factor of 20%.

Working in a Standing Position

Seats

Continuous standing or sitting while working is a common source of discomfort and fatigue.

Frequent changes of body positions, including sitting and standing, helps to avoid fatigue.

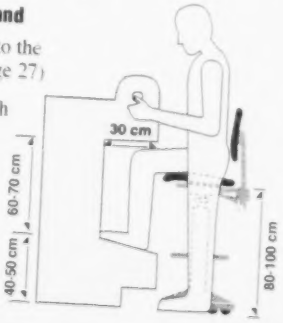
Workstand for Sit/Stand

☑ ADJUST workstation to the proper height. (See page 27)

USE a swivel chair with an adjustable seat.

ADJUST the chair seat height to 25-35 cm below the work surface.

USE a footrest with a height of 40-50 cm.



Footwear

☑ WEAR shoes that do not change the shape of your foot. Your feet can only be as comfortable as the footwear permits.

WEAR shoes that allow freedom to move your toes. Pain and fatigue result if shoes are too narrow or too shallow.

ENSURE shoes have arch supports. Lack of arch support causes flattening of the foot.

WEAR shoes with lace-up fastenings.

USE padding under the tongue if you suffer from tenderness over the bones at the top of the foot.

☒ DO NOT WEAR completely flat (heel-less) shoes.

DO NOT WEAR shoes with heels higher than 5 cm (2 inches).

SELECT footwear taking into account individual fit and comfort. Try on and walk in before using.

Floors

☑ KEEP work areas clean.

AVOID standing on concrete or metal floors for a long time. Recommended for standing work are wooden, cork or rubber covered floors.

ENSURE that the floors are level and non-slippery.

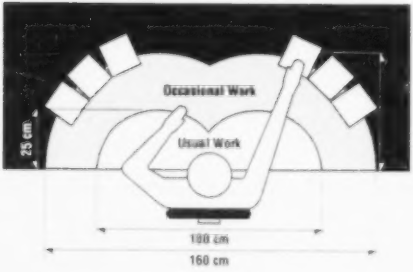
COVER concrete or metal floors with mats. Slanted edges on mats help prevent tripping.

DO NOT USE thick foam-rubber mats. Too much cushioning can cause fatigue and it becomes a tripping hazard.

Work Organization

Work organization determines what jobs to do and how to do them. It gives the individual flexibility to vary their body positions and reduces the time spent doing the same repetitive or forceful movements. Important components of good work organization are:

- work pace;
- training and education;
- rest breaks;
- adjustment periods; and
- work breaks.



Work Station Layout

Improperly laid out work materials can create the risk factors for WMSD. A poor layout makes it hard to reach work objects without twisting, reaching or bending. One good way to arrange work materials is in a semi-circle shape.

Task Variety

There are at least three ways to vary tasks within a job:

- Job rotation—People move from one task to another according to a schedule.

- Job enlargement — More variety is added to the job.
- Team work — People form a team and each member of the team shares several different tasks.

Work Pace

Too fast a pace of work allows the body little recovery time between repetitive or forceful movements. This increases the risk of developing WMSD.

A good work pace should be determined by the joint efforts of management and workers. Such efforts can help to establish reasonable work quotas, schedules and goals that meet specific needs. Incentive systems that reward workers for the quality of work can also encourage a good work pace. On the other hand, incentives for the amount or quantity of work is likely to increase the risk of error, poor quality and WMSD.

Work Breaks

Work breaks are the times when we stop working on one task and start another, allowing us to use different parts of the body. Work breaks can help prevent WMSD by allowing us to rest, stretch or change body positions when we need to. For continuous VDT work, a work break of 5 to 15 minutes per hour is generally recommended.

Rest Breaks

Rest breaks are the times we stop working. Besides getting a refreshment, we should use this time to stretch and change body positions.

Adjustment Periods

An adjustment period is the time we need to get "in shape" when we return to our job after a long absence, or when we start a new job. It should allow us to build up muscle strength before we work at full capacity. The length of an adjustment period depends on the type of job.

Training and Education for Task Performance

Training and education are important for working safely and keeping well. Even the best work organization and workplace design cannot prevent WMSD if the training and education program is not adequate.

The contents of the office ergonomics training should include risk factors that can cause WMSD and proper work practices to prevent WMSD. Also, people must learn how to adjust their chair, desk, monitor, keyboard, mouse and workstation in general to prevent WMSD.

To be successful, the training program must be organized, consistent and ongoing. Everyone should be involved, including workers, managers, and health and safety representatives.

Tool, Equipment and Furniture Design

Ergonomic aspects must be taken into consideration when purchasing new tools, equipment and furniture or when moving to a new office location.

Consider the individual characteristics

The individual characteristics of the people who will be using the tools, equipment and furniture makes a big difference. These characteristics include:

- body size;
- height;
- gender; and
- right-or left-handedness.

Consider ergonomic aspects of use

The user of tools, equipment or furniture should be able to work:

- in a neutral body posture without excessive bending, reaching, twisting, and slouching;
- with wrist and hand in neutral position;
- without holding a single posture too long;

- without applying excessive force;
- without excessively repetitive movement involving same motions performed at a high frequency for several hours;
- without exposure to vibration; and
- without being exposed to unacceptable environmental conditions lighting, noise, heat, cold, and humidity.

Involve workers in the decision making process

Seek the opinion of workers in selecting tools, equipment and furniture. People tend to accept changes if they are involved in the decision making process. Of course, consulting a specialist is always a valuable investment in selecting proper tools, equipment or furniture.

Manual Material Handling

Many people in office environments need to move boxes and other heavy objects. Manual material handling involves lifting, lowering, pulling, pushing, carrying and holding materials. These activities pose risk of WMSD especially back injuries.

Guidelines for Manual Material Handling

☑ REDUCE the weight of the load:

- reduce the size by repacking;
- reduce the number of objects; or
- seek help from co-workers to lift extra-heavy loads.

MAKE the load easier to handle:

- change the load's size and shape to move the centre of gravity nearer to the lifter;
- store the load at or above hip height but below shoulder height to avoid the need to bend, or reach above shoulders;

- use more than one person or a mechanical device to move the load;
- drag or roll the load with handling aids such as carts, rope, or slings; or
- transfer the weight of the load to stronger parts of the body using handgrips, straps or belts.

USE storage techniques to ease material handling:

- store loads at waist level;
- use wall brackets, shelving or pallet stands of appropriate height; or
- load pallets so that heavy articles are around the edges of the pallet and not in the centre.

REDUCE the distance a load is carried:

- improve the layout of the work area; or
- relocate production or storage areas.

REDUCE the number of lifts:

- assign more people to the task;
- use mechanical aids; or
- rearrange the storage or work area.

REDUCE twisting of the body:

- keep all loads in front of the body;
- allow enough space for the whole body to turn;
- turn by moving the feet rather than twisting the body; and
- minimize bending to lift or shift a load.

DO NOT TWIST while lifting, moving, pushing or pulling a load.

DO NOT BEND to the side during manual handling.

DO NOT SHIFT or raise a heavy load with outstretched arms.

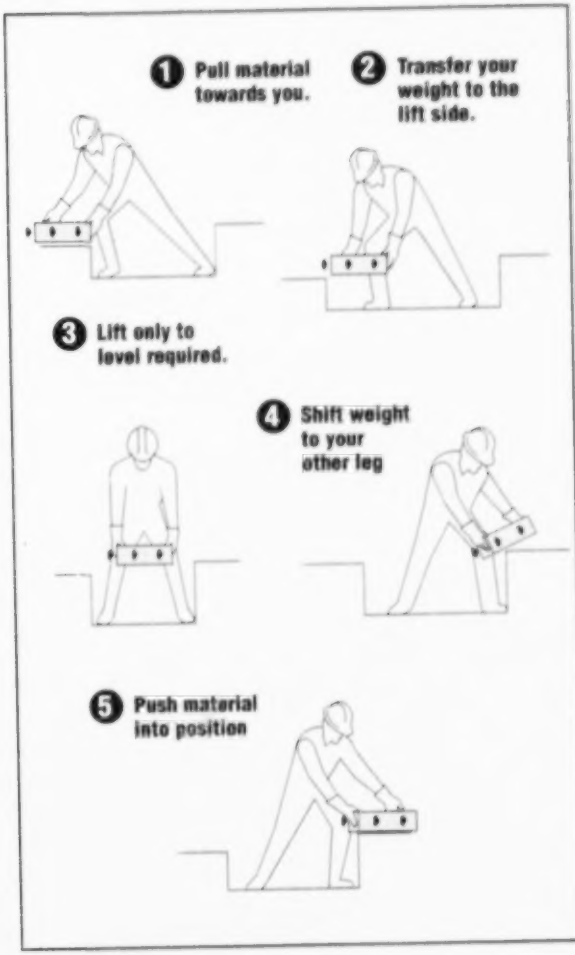
DO NOT CARRY loads a long distance.

DO NOT SWING and throw heavy loads.

Guidelines for Lifting Boxes

Store boxes at waist height
DO NOT BEND over and try to lift box all at once
To Lift from the ground
1 Raise box upright
2 Put one knee against box
3 Pull box up the leg
4 Rest box on edge of knee of the other leg
5 Stand upright
Carry the load with your back in upright position
6

Guidelines for Transferring Boxes


1 Pull material towards you.
2 Transfer your weight to the lift side.
3 Lift only to level required.
4 Shift weight to your other leg
5 Push material into position

Work Environment

The work environment includes:

- ventilation;
- noise;
- temperature and Humidity; and
- lighting and Vision.

Ventilation

The purpose of ventilation is to control the indoor temperature, humidity, odour, and airborne contaminants and to introduce outdoor air (fresh air).

There are two kinds of ventilation

1. Dilution ventilation.
2. Local exhaust ventilation.

Dilution ventilation – This type of ventilation reduces the indoor air contaminants by the dilution process. The used (contaminated) indoor air is exhausted at a preset rate replaced by taking in outdoor air at an equal rate. The ventilation system evenly distributes the air throughout the occupied space.

Dilution ventilation is used when:

- airborne contaminants are relatively non-toxic;
- emission sources are widely distributed in an area; and
- dilution air is not contaminated.

Local exhaust ventilation – The purpose of local ventilation is to exhaust the toxic gases, fumes, dusts and vapours near the point of emission to prevent mixing of these toxic emissions with the indoor air. Fume hoods are the most commonly used local exhaust ventilation.

Ventilation Standards

Acceptable ventilation standards are defined in the building code applicable to your workplace. The ASHRAE 62-1989 standard, by the American Society of Heating, Refrigeration and Air Conditioning Engineers, is referenced in most building codes. This standard lists the required minimum rate of outdoor air intake for different types of workplaces. For offices, the required minimum rate of outdoor air intake is 20 cfm (cubic feet per minute) per person or 10 litres per second per person.

Office Noise Levels

The level of noise in an office depends on: the nature of the work performed, the operation of equipment such as photocopiers, printers, typewriters and ventilation systems, the material used in floor and wall coverings, and the quantity and volume of telephone and conversational activity.

Industrial noise regulations are intended to prevent hearing loss and allow a sound level of 85 dB(A) - 90 dB(A) for an 8-hour workday. These limits vary from one jurisdiction to another. Office noise is not loud enough to cause hearing loss. However, it can reduce concentration, cause stress and annoyance and interfere with communication.

There are guidelines for limiting office noise but there are no legal requirements.

The main objectives of the office noise guidelines are:

- to prevent interference with verbal communication;
- to prevent annoyance and stress; and
- to minimize interference with concentration in the performance of mental work.

At noise levels below 45 dB(A), very few people are disturbed. At levels around 55 dB(A) about half of the people feel some degree of disturbance. Intermittent noise and varying levels of noise are more annoying than continuous noise. Taking all these factors into account, it is

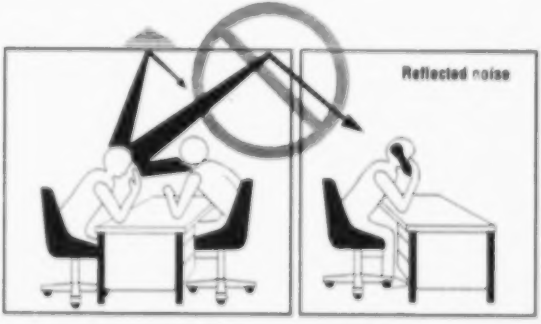
generally recommended that noise levels in an office should be about 50 dB(A).

Masking Sound

Artificial constant background noise (known as white noise, masking sound or sound conditioning) is generally introduced in open plan offices. The purpose of masking sound is to conceal weak sounds from adjacent areas and provide privacy for verbal communication across an office desk. The level of such masking sound should not exceed 48 dB(A).

Guidelines for Noise Control

- ☑ SELECT quiet equipment.
- ENSURE that equipment is well maintained.
- ISOLATE noisy equipment from general work areas.
- USE sound-absorbing materials such as carpeting, curtains, acoustic baffles and typewriter pads.
- CHOOSE and position acoustic screens carefully. The position of light fixtures, walls and desks can change noise levels.
- USE conference rooms for conversations that could distract other workers.
- SCHEDULE noisy tasks when they least affect others.



Temperature and Humidity

TEMPERATURE AND HUMIDITY together affect comfort.

OPTIMUM OFFICE TEMPERATURE is 20-23.5°C (70-74°F) in the heating season and 23-26°C (73-75°F) in the cooling season (CSA Z412-M89 standard).

OPTIMUM OFFICE HUMIDITY is greater than or equal to 25% in the heating season and less than or equal to 68% in the cooling season (CSA Z412-M89 standard).

OFFICE VENTILATION systems are complex. Generally, building maintenance engineers maintain them. Report ventilation problems to the joint health and safety committee.

USE portable heaters only if the proper authority approves them. Heaters are potential fire hazards.

DO NOT USE heaters that can produce toxic fumes. (eg. kerosene heaters).

USE only heaters with thermostats.

PLACE heaters or fans so that they do not blow air directly on people.

KEEP heaters away from combustible materials and curtains.

PLACE fans so that they do not vibrate and fall off surfaces.

UNPLUG heaters and fans and wait for blades to stop before moving them.

USE window curtains or blinds to increase or decrease heat from the sun.

CONSIDER impact on ventilation before rearranging office equipment or furniture.

WEAR clothing appropriate for the office conditions.

ENSURE that ventilation systems, dehumidifiers and humidifiers are properly cleaned and maintained.

Standard: American Society of Heating, Refrigeration and Air Conditioning Engineers, (ASHRAE) Standard 55-1992 and CSA standard Z412-M89 are generally used to ensure adequate thermal environment.

Lighting and Vision

Lighting

Both intensity and quality of lighting (illumination) are important. Common lighting problems include too much light, too little light, glare and shadows. In order to see fine objects and read in poor lighting, people often use awkward body positions. Lighting should be evenly distributed throughout the workplace and should not create glare or shadows.

While office work is not known to cause permanent vision or eye problems, many office workers report eyestrain, a burning sensation in the eyes, blurred vision, eye irritation, dry eyes and headaches.

Contributing factors are:

- non-adjustable workstations where reading materials are too far away;
- poor image quality on VDTs;
- inadequate lighting, glare and shadows;
- low humidity which causes the eyes to become dry, itchy and irritated;
- uncorrected vision; and
- poor job design which results in long periods of visually demanding tasks.

Preventing Vision Problems

- ☑ POSITION work so that it is easy to see. Use adjustable chairs, well-positioned VDTs, adjustable work surfaces, and task lights.

USE legible source documents and VDTs with good image quality.

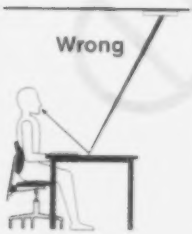
MAINTAIN adequate humidity levels to prevent dry eyes.

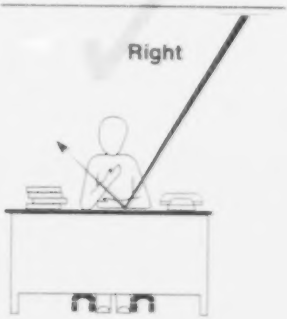
ENSURE regular eye examinations to avoid problems of uncorrected or improperly corrected vision. People who work with video display terminals (VDT) may require a special prescription to be able to read at an intermediate distance that bifocals can not accommodate.

ENCOURAGE frequent changes in body position by varying tasks and using good work/rest schedules.

POSITION desk with window to the side of the worker.

POSITION desk so that ceiling lights are to the sides. Avoid placing desk where light fixtures are directly in front.

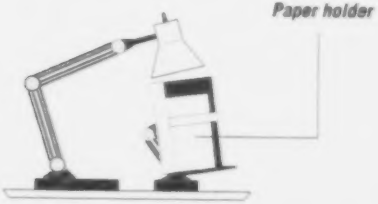




ADJUST window blinds or drapes to control light levels and glare.

USE low reflectance finishes and neutral colours on walls and furniture. The colour and finish of a surface determines how much light it reflects.

USE adjustable task lights to increase light levels when needed. Older workers may need more light.



REPLACE flickering fluorescent tubes and maintain fixtures properly.

LOOK up and away from work frequently to rest the eyes.

WORK from good contrast, clear copy. Higher light levels are required for poor copy.

ENSURE that storerooms, corridors and stairways are well lit.

Appropriate light levels depend on visual preferences and type of work. In the following chart, the higher ranges are for workers with poorer vision and for work requiring high speed or accuracy.

Location	Light Level (LUX)
Corridors	50-150
Stairs	100-200
Coat Rooms	100-200
Stock Rooms	200-400
Traditional Office Tasks	500-750
Conference Rooms	300-750
Drawing Offices	500-1000

Check with the occupational health and safety agency or department in your jurisdiction for regulations regarding light levels.

DO NOT hang glossy pictures or objects in places where light will reflect into eyes.

DO NOT place a VDT facing a window.

4. Ergonomic Aspects of Visual Display Terminals

✓ *VDT Workplace Checklist*

VDT workplaces must be flexible enough to accommodate individuals using them.

Use this checklist to identify problems in a VDT workplace.

"NO" answers indicate a potential problem that requires adjustment or changes in the workplace or job design.

VDT

- ☐ Top surface of the keyboard space bar (or bottom row of keys) is no higher than 6.5 cm (2.5 in.) above the work surface.
- ☐ During keyboard use, the forearm and upper arm form an angle of 80°-100°, with the upper arm almost vertical.
- ☐ The wrist is relaxed and not bent. Wrist rests are available.
- ☐ If used primarily for text entry, keyboard is directly in front of the operator.
- ☐ If used primarily for data entry, keyboard is directly in front of the keying hand.
- ☐ Top of screen is about eye level with head up.
- ☐ Viewing distance is 30 to 60 cm (12 to 24 in.).
- ☐ Screen is free of glare or shadows.
- ☐ Letters on the screen are sharp, easy to read and do not flicker.

Chair

- ☐ Chair height is appropriate for the individual and the work surface height.
- ☐ Chair has wheels or castors suitable for the floor surface.
- ☐ Chair swivels.
- ☐ Backrest is adjustable for both height and angle.
- ☐ Backrest supports the inward curve of the lower back.

- Footrests are used if feet do not rest flat on the floor.
- Seat does not cause pressure on the back of the legs, and feet are flat on the floor or on a foot rest.
- Chair is adjustable from the sitting position.
- Chair upholstery is a breathable fabric.

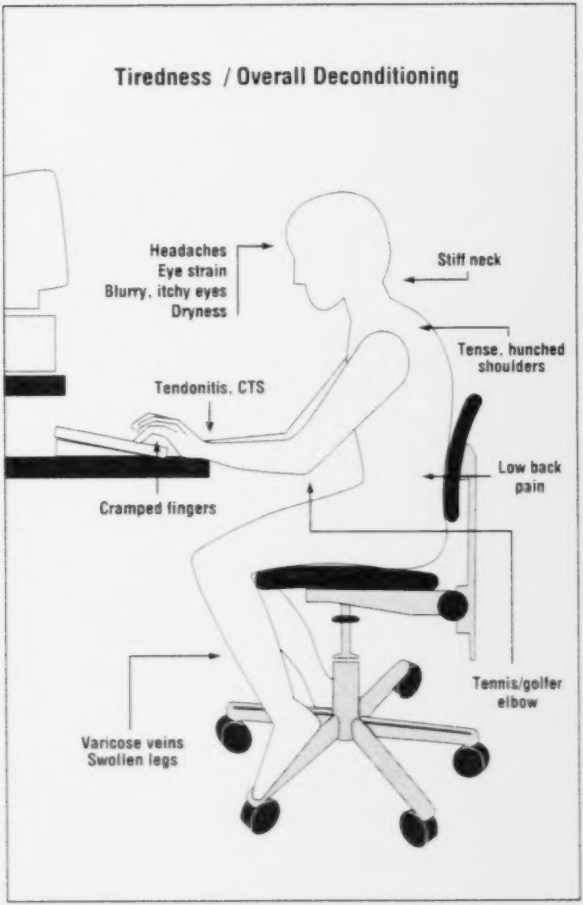
Work Surface

- Work surface height is adjustable.
- Leg room is sufficient to change position of legs without getting up.
- Work surface is large enough to hold work materials.
- Frequently used items are close to and in front of the operator.
- Infrequently used items are stored separately.

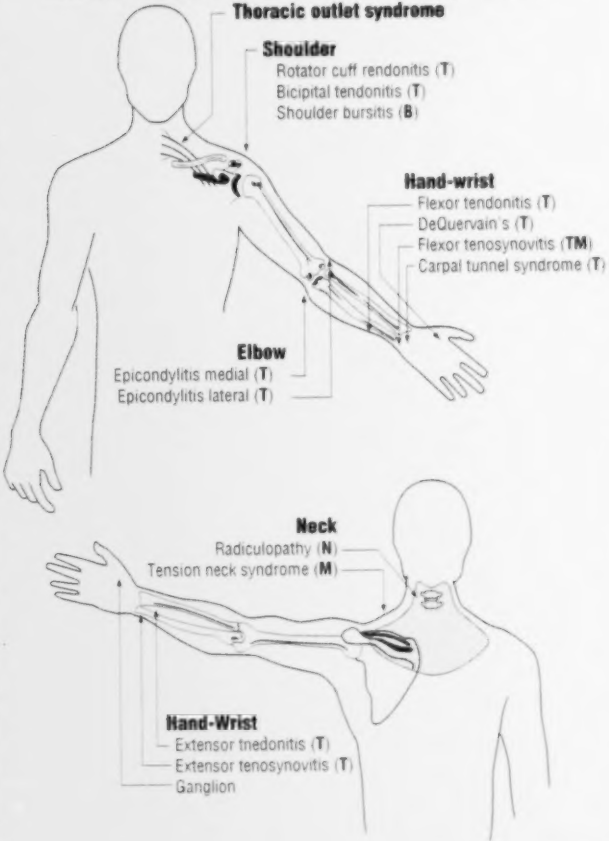
Visual Environment

- Lighting does not produce glare or reflection on the screen.
- Lighting does not interfere with reading characters on the screen and source document.
- Wall colour is neutral and not too bright.
- Shiny surfaces and objects are covered or removed.
- Windows have blinds or curtains to prevent glare.
- VDTs are located away from windows, or screens are at a 90° angle to windows.
- Ceiling fluorescent lights are oriented lengthwise to the sides of the VDT.
- Room lighting is uniform and slightly dimmer than usual office lighting.
- General work areas have indirect or diffused lighting.
- Ceiling fluorescent lights are covered with diffusers or parabolic louvers.
- Adjustable task lights are available over source documents.

Common Health Hazards



WMSD Related to Using Computers



T – Tendon/ligament **M – Muscles**
N – Nerves **B – Bursa**

Common Symptoms and Causes

Location	Cause
Neck pain	Monitor too high
	Chair too low
	Monitor or document holder too far off the line of vision
	Poor sitting posture
	Slumping and slouching
	Typing with winged-up shoulders
Shoulder pain	Tense shoulders while typing
Elbow pain	Desk is too high
	Operating the mouse located too far to the side
Carpal tunnel syndrome	Excessive up and down wrist and finger movement
	Typing with wrists bent upwards
	Tense or tight grip on a mouse
Low back pain	Long periods of sitting in one position
	Poor sitting position
	Slumping and slouching
	Chair is too high
Eyes	Reading materials too close or too far
Eye strain	Too much or too little illumination
Blurry, itchy eyes	Glare
Dryness	Improper location of reading materials
	Uncorrected vision
	Low humidity

VDT Workstation Adjustment

☑ ADJUST VDT using various features that are built in or that can be added.

ELIMINATE glare caused by lights, windows or bright objects.

ADJUST screen brightness and contrast. It is easier to read from the screen if characters are brighter than the background. Be careful not to make characters too bright.

ADJUST the screen height so the top is just about eye level.

TILT the screen slightly backwards. Ensure that this does not create glare on the screen.

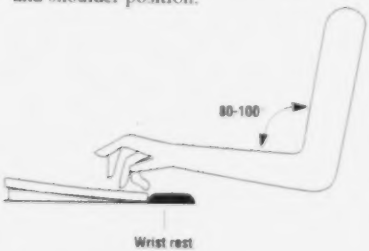
ADJUST chair, work surface and keyboard heights properly. (See page 30)

POSITION keyboard:

- directly in front of operator for two-handed typing; or
- in front of keying hand for one hand typing.

LEAVE a large area free for source documents and other work materials.

MOVE the keyboard occasionally to change the arm and shoulder position.



Good hand position for keyboard use

USE an adjustable document holder. Place it next to the screen and at the same height. The head will have to turn less and eyes will adjust more easily. Refer to figure on next page (VDT Workstation).

ALTERNATE position of document holder on either side of VDT to vary head position.

CONNECT keyboard to VDT with a cord that is at least 70 cm (28 in.) long.

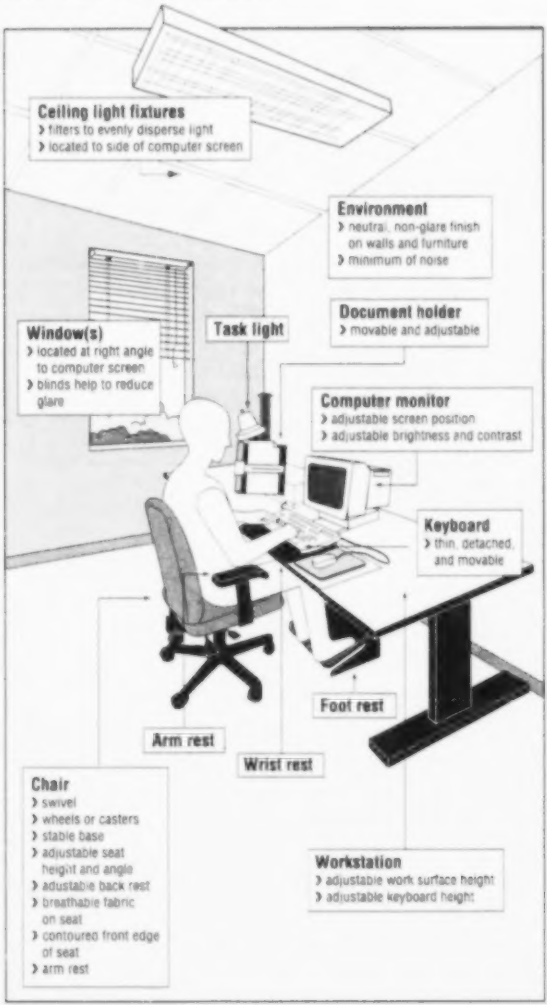
CLEAN the VD T screen regularly. Follow the manufacturer's instructions.

REPORT to your supervisor if you experience problems with VDT controls, flicker or excessive noise.

You and Your Workstation

Shoulder(s) and hip(s) in line
Chin in line with the centre of the screen
Keyboard directly in front of you
Mouse close to the keyboard and at the same level
Back rest fits inward curve of spine
Armrest at elbow height
Wrist in a neutral position (no bending)
Knees slightly lower than hip
Seat pan height just below knee cap
Feet flat on floor or footrest

The VDT Workstation



Using the Computer Mouse

Users of the computer mouse often experience sore fingers, wrists, arms and shoulders. Ergonomists indicate that this condition may be caused by:

- design of the mouse,
- where you place the mouse on your desk, and;
- how you use the mouse.

Tips for the use of the mouse

☑ HOLD the mouse loosely in your hand and relax your grip. A tight grip will not help to position the pointer any more accurately or quickly.

KEEP your wrist straight. Your forearm, wrist and fingers should all be in a straight line.

TRY making circles with the mouse with a relaxed shoulder and grip. Practice making the circles smoother and smoother until you are comfortable with them. Next, try making a figure 8.

ADJUST the mouse speed setting. The mouse is harder to control if you use a fast setting. Some computer users also get relief from using the mouse use by using keystroke combinations for various computer program functions.

☒ DO NOT SQUEEZE the mouse or press buttons with excessive force.

Selecting the Right Mouse

Several different designs of a computer mouse are available. It is not known which design best helps prevent injuries. Employees should be given an option to try different models and see which suits their needs. The following tips may be helpful:

Battery-powered Mouse

A battery-powered cordless mouse is highly recommended, because there is no cord to get in the way.

Examples of mouse shapes

Shape:

☑ CHOOSE a mouse that fits your hand. Many people find the "teardrop" shape comfortable.

CHOOSE a flat shaped mouse, which reduces wrist extension.

CHOOSE a mouse that is shaped the same on both sides.

AVOID a curved mouse.

Size:

CHOOSE a mouse that is large enough to support the natural curve of your hand.

You may use a larger mouse that still fits in the palm of your hand. It helps you use your larger arm muscles which do not tire as easily as the smaller wrist muscles.

Buttons:

☑ CHOOSE a mouse with buttons that respond to a light touch, so that you don't have to press too hard to make it work.

CHOOSE a mouse with buttons that neither cramps the fingers nor spreads them out too far apart.

CHOOSE a mouse with a "drag lock" or "click lock" function.

Placement of a Computer Mouse

The mouse is often placed around the upper right hand corner of the keyboard and toward the back of the desk.

Stress points are indicated by

Placing a mouse between you – the computer operator – and your keyboard greatly improves your working posture, because you don't have to reach too far. By putting the mouse directly in front of you, you are more balanced, centered, and comfortable, so you will feel

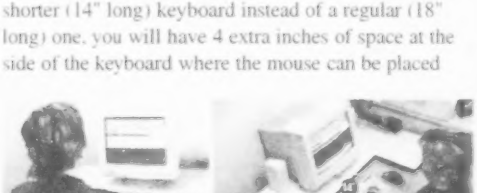
Place the mouse between you and the keyboard

less muscle fatigue, less discomfort, and will also reduce the risk for injuries (e.g., work-related musculoskeletal disorders (WMSDs)).

To easily operate a mouse while it is in front of you, it is essential that you use a cordless mouse. It's also important that for conventionally sized computer monitors (CRTs), the computer workstation has to be a minimum of 34"-36" deep. Heavy set individuals or people with shorter than average arms may not find this arrangement as comfortable.

Shorter keyboards

Computer keyboards come in many sizes. By using a shorter (14" long) keyboard instead of a regular (18" long) one, you will have 4 extra inches of space at the side of the keyboard where the mouse can be placed



Using a shorter Keyboard

Advantages of a shorter keyboard

The extra 4 inches gained by using a shorter keyboard allows you to place the mouse closer to you, so that you do not have to reach too far sideways.

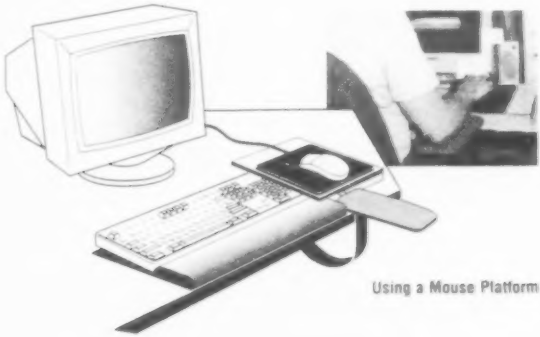
Fewer sideways movements mean you will be more comfortable and less likely to get injured.

Disadvantages of a shorter keyboard:

A shorter keyboard means you have to get used to a slightly different key arrangement. However, most people don't mind this as long as using the mouse becomes more comfortable.

Using a mouse platform

When there is not enough space on the desk to position a mouse within easy reach, you can use a mouse platform. A mouse platform covers the rarely used numerical pad on the right side of the keyboard. The mouse is then closer to the person using it. As well, because the mouse is on a platform, you avoid the tendency to wiggle it farther and farther away.



Using a Mouse Platform

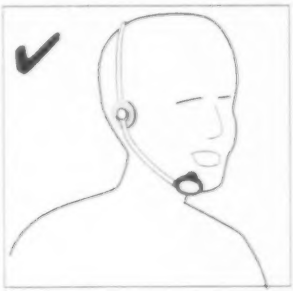
Using the Telephone while Operating a VDT

Talking on the phone while typing or writing notes forces you to cradle the receiver between your shoulder and chin. This results in tension in the shoulder and neck causing discomfort and risk of musculoskeletal injury.

☑ PLACE the telephone close to you on your right side if you are right-handed. It reduces repetitive reaching.

USE a head set instead of conventional telephone set. In noisy areas consider the use of biaural headsets.

Correct position



Incorrect position

If you use your phone frequently, use a headset to reduce awkward neck postures

Radiation from VDTS

Video display terminals are potentially capable of emitting the following types of radiation:

- x-rays from picture tube
- electromagnetic radiation of very low frequency (VLF) from electronic components that produce letters and images on the screen; and
- electromagnetic radiation of extremely low frequency (ELF) from electrical circuit inside VDT.

X-rays

The picture tube (cathode ray tube, CRT) of the VDT produces low-energy x-rays. Such x-rays are absorbed in the glass housing of the picture tube. At the operator position, x-rays are not measurable. VDT operators do not need any kind of personal protective equipment (such as lead aprons) to protect themselves from x-ray exposure.

VLF Electromagnetic Radiation

VLF electromagnetic radiation is emitted by electronic components that produce images and letters on the VDT screen. The level of radiation at the operator's position is far below recommended exposure limits. In the past, there has been a concern regarding a possible link between VLF electromagnetic radiation exposure and adverse pregnancy outcomes. Recent studies did not confirm such a link.

ELF Electromagnetic Radiation

ELF electromagnetic radiation is emitted as a result of electric power use. All electrical equipment and appliances emit ELF electromagnetic radiation. Some researchers have found an increased risk of leukemia and brain cancer in people who live or work near electric power lines. There is no scientific evidence of health risks due to ELF electromagnetic radiation exposure among VDT operators.

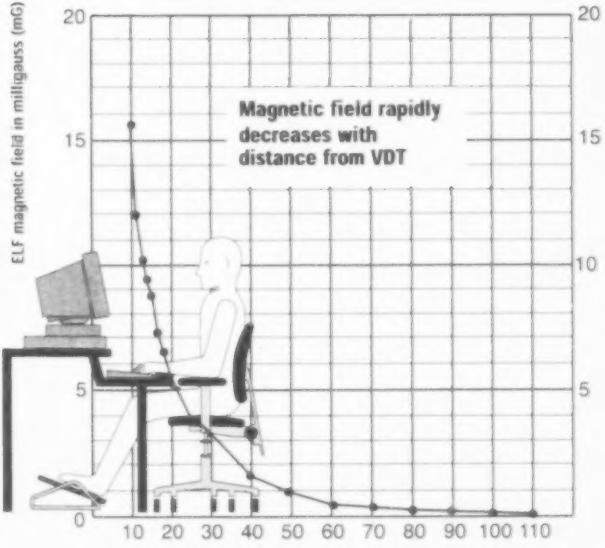
Exposure Limits

There are no Canadian or US exposure limits specific to VDT.

Protection: Prudent Avoidance (Precautionary Principle)

The scientific research results are not conclusive regarding possible links between electromagnetic radiation exposure and cancer. As a result, we are unable to determine safe exposure limits. In view of this uncertainty, we recommend prudent avoidance as a preventive measure which means to avoid all unnecessary exposures.

Electromagnetic fields decrease rapidly as the distance from VDT increases. Sitting as far back as comfortable and keeping distance from adjacent VDTs will reduce exposure level.


ELF magnetic field in milligauss (mG)
20
15
5
0
Magnetic field rapidly decreases with distance from VDT
10 20 30 40 50 60 70 80 90 100 110
Distance from the screen in cm.

Working with VDTs in a Standing Position

ADJUST the height of the work surface to about the height of the elbow.

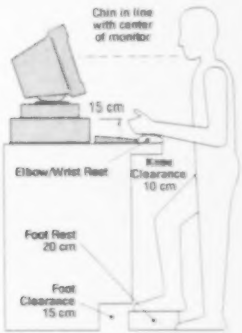
ORGANIZE your work so that the usual operations are within easy reach.

FACE the object that you work with at all times.

KEEP your body close to the work.

ADJUST the workplace to get enough space to change working position.

USE a footrail or portable footrest to shift body weight from both legs to one or the other.



USE a seat whenever possible:

- while performing your job; or
- at least occasionally when the work process allows for rest.

DO NOT REACH behind the shoulder line. If necessary, shift feet to face the object.

DO NOT OVEREXTEND your reach beyond the point of comfort.

DO NOT REACH above shoulder height.

Documentation Holder

USE an A-frame document holder which has sufficient room for adjustment to raise, lower and angle the document to accommodate different screen heights.

VDT screen

Adjust VDT monitors above desk height to reduce postural strain to the neck muscles. The top of the VDT should generally be level with the user's horizontal eye level and at a distance of about one arm length when the operator is standing in his/her usual position for keying.

Chairs for Sit/Stand Workstation

- [x] ENSURE that the seat has a minimum width of 40 cm.

CHOOSE back rests that are contoured vertically and horizontally.

USE a seat covering made of non-slip, breathable fabric.

SELECT a seat padding about 2-3 cm thick.

WHEREVER POSSIBLE, the workstation design should permit working in sitting or standing position at will.

See page 30 for "Saddle Chair"

VDT Workplace – Job Design

No matter how well designed a workplace is, health and safety problems arise if little attention is paid to how work is done.

VDT work often involves repetitive movements of the hands and few changes in body position. This can lead to muscle pain and strain.

☑ VARY work tasks. Break up VDT work by doing non-VDT tasks that place different demands on the body by changing body position.

WORK at a reasonable rate. Too fast a work pace contributes to muscle strain. Too slow a work pace contributes to boredom.

LOOK away from the screen occasionally and focus on a distant object to rest the eyes.

TAKE regular rest breaks to ease muscle aches, eye strain and stress.

USE rest breaks to stand up, move around and change mental activity.

RELAX muscles, stretch and change position. Exercises can be done at the VDT.

5. Office Safety

Most office accidents result from slips, trips, falls, lifting, being caught in or between objects, punctures or cuts.

Filing Cabinets

☑ USE filing cabinets that allow one drawer to be open at a time.

PLACE cabinets so that drawers do not open into aisles.

CLOSE cabinet drawers when not in use.

LOAD cabinets starting from the bottom for stability.

SECURE cabinets to wall or floor.

USE handles to close drawers to avoid catching fingers.

AVOID overfilling cabinets to prevent paper and staple cuts.

USE a proper ladder or step stool to reach high places. Do not use a box, desk or rolling chair.

☒ DO NOT KEEP heavy objects on top of tall filing cabinets.

DO NOT OPEN more than one drawer at a time.

Office Equipment

☑ USE fingertip guards when handling paper.

STORE pencils and pens point down or flat in drawers.

SHEATH scissors, letter openers, razor blades or other sharp tools before storing.

USE paper cutter safely:

- keep knife blade in locked position;
- use proper guards;
- maintain firm grip on blade handle; and
- do not cut too many papers at once.

USE a staple remover to remove staples.

FILE sharp edges off metal furniture.

Floors and Stairs

☑ CLEAN up spills and tracked-in rain or snow.

PICK objects up off the floor. Even paper, pencils and rubber bands can cause trips and falls.

USE slip-resistant preparations on linoleum, tile, or other polished floor surfaces.

SECURE carpets and rugs.

USE handrails on stairs.

REMOVE stairway distractions (e.g. mirrors, posters).

WALK on the right.

INSTALL mirrors at blind, busy corners.

DO NOT RUN, especially near corners.

DO NOT STORE boxes, equipment or supplies outside doorways or in aisles.

DO NOT CARRY loads that obstruct vision.

DO NOT PARTICIPATE in horseplay.

Office Machines

KEEP long hair, fingers and jewellery away from moving machinery.

USE proper guards on machines.

OBSERVE directions and cautions when adjusting machinery.

CALL service for repairs.

DISCONNECT and report frayed electrical cords or plugs.

UNPLUG equipment when not in use or before making adjustments.

Fire Safety

USE nonflammable waste baskets.

STORE oily or solvent-soaked rags in fireproof containers.

DISPOSE of cigarette, cigar or pipe ashes properly.

KNOW evacuation procedures and the location of exits.

KNOW the location and classes of fire extinguishers and how to use them.

WEAR appropriate personal protective equipment and observe safety procedures when entering a plant or factory.

6. Exercises in the Office

Exercises at the Desk

VDT work often involves repetitive movements of the hands and few changes in body position. This can lead to muscle pain and strain.

☑ LOOK away from the screen occasionally and focus on a distant object to rest the eyes.

TAKE regular rest breaks to ease muscle aches, eye strain and stress.

USE rest breaks to stand up, move around and change mental activity.

RELAX muscles, stretch and change position.

Exercises can be done at the VDT workstation. Consult your doctor about exercise that is suitable for you.

Hand and Forearm Exercises

1.

Starting Position
Step 1
Make a fist.
Step 2
Touch your fingertips to the base of your palm, keeping the thumb straight.
Step 3
Gently make a hook. Don't force your fingers with your other hand if something is painful.

2. Gently bend wrist from side to side as far as possible. Hold 3-5 seconds. Repeat 3 times.

3. Start with arm in hand-shaking position and slowly rotate palm down until you feel a stretch. Hold 3-5 seconds. Then rotate palm up until you feel a stretch. Repeat 3 times.

4. Keeping elbow straight, grasp involved hand and slowly bend wrist down until you feel a stretch. Hold 3-5 seconds. Relax. Repeat 3 times.

5. With involved hand in a handshake position, grasp and slowly turn it to a palm down position until you feel a stretch. Hold 3-5 seconds. Relax. Repeat 3 times.

6. Sitting with elbows on table and palms together, slowly lower wrists to table until you feel a stretch. Be sure to keep palms together throughout the stretch. Hold 5-7 seconds. Relax. Repeat 3 times.

Neck and Shoulder Exercises

1. Shoulder Shrug

Purpose: To relieve early symptoms of tightness or tension in the shoulder and neck area.

Raise the top of your shoulders toward your ears until you feel slight tension in your neck and shoulders. Hold this feeling of tension for 3-5 seconds, then relax your shoulders downward into their normal position. Do this 2-3 times.

2. Head Glide

Purpose: To stretch chest, neck and shoulder muscles.

Sit or stand upright. Without lifting chin, glide head straight back. You know you're doing this exercise right if it gives you the feeling of a double chin. Hold for 20 counts and repeat 5-10 times.

3. Neck Relaxer

Purpose: To relax neck muscles.

Drop your head slowly to the left, trying to touch your left ear to your left shoulder. Repeat on the right side. Slowly drop your chin to your chest, turn your head all the way to the left, then turn all the way to the right.

4. Shoulder Roll

Purpose: To relax shoulder muscles.

Slowly roll your shoulders backward five times in a circular motion. Then roll shoulders forward.

Back, Side and Leg Exercises

1. Back/Side Stretch

Purpose: To relax the back and side muscles.

Interlace fingers and lift arms overhead, keeping elbows straight. Press arms as far back as you can. To stretch sides, slowly lean to the left, then to the right.

2. Middle/Upper Back Stretch

Purpose: To stretch upper and middle back muscles.

Hold your right arm with your left hand just above the elbow. Gently push your elbow toward your left shoulder. Hold stretch for 5 seconds. Repeat on left arm.

3. Back Curl

Purpose: To stretch lower back and legs.

Grasp shin. Lift leg off the floor. Bend forward (curling the back), reaching nose toward the knee. Repeat with the other leg.

4. Ankle Flex and Stretch

Purpose: To stretch ankle muscles.

Hold one foot off the floor, leg straight. Alternately flex ankle (pointing toes up) and extend (pointing toes toward the floor). Repeat with the other leg.

5. Leg Lift

Purpose: Stretch leg muscles.

Sit forward on the chair so that your back is not touching the chair's backrest. Place feet flat on the floor. With a straight leg, lift one foot a few inches off the floor. Hold momentarily, return it to the floor. Repeat with the other leg.

7. Education and Training

Ergonomic education should be a part of the overall health and safety education specific to the workplace. Training should emphasize safe work practices and methods of adjusting workstations to prevent WMSD.

A typical training session should include:

- an explanation of the ergonomic program;
- the ergonomic hazards that cause WMSD;
- how to deal with WMSD and back injuries;
- how to report a suspected WMSD case;
- how to minimize the risk of WMSD;
- actions taken by management to reduce occurrences of WMSD; and
- the ergonomic aspects of VDT operation.

Section III

Ergonomic Regulations, Standards and Guidelines

1. Canadian Standards
2. International Standards

1. Canadian Standards

1. Canadian Standards Association. CSA Z412-M89 Standard. 1989.
2. British Columbia. Workers Compensation Act: Occupational health and Safety Regulations (BC Reg 296/97) Section 4.46 to 4.53. Saskatchewan. Occupational Health and Safety Act. 1993: Occupational Health and Safety Regulations. 1996. Section 78 to 83 Ontario. Guideline. VDT Workstations: Layout and Lighting.

2. International Standards

1. California's Ergonomic Rule: General Industry Safety Orders. Section 5110. Ergonomics. Effective July 3. 1997.
2. U.S. Occupational Safety and Health Administration (OSHA): Proposed Ergonomic Rule. November. 1993.
3. American National Standards Institute: Draft Standard. ANSI Z-365 1995.
4. International Standardization Organization: ISO 9241 Standard. Ergonomic Requirements for Office Work with Visual Display Terminals.
   Part I General Introduction (1997).
   Part II Guidelines on Task Requirements (1992).
   Part III Visual Display Requirements (1992).
5. International Standardization Organization: ISO 6385 Standard. Ergonomic Principles of the Design of Work Systems. 1981.
6. ACGIH TLVs Booklet:
   - Hand Activity Level TLV
   - Lifting TLV

Section IV

Occupational Health and Safety Legislation

1. Canadian Occupational Health and Safety Legislation

Government's Responsibilities

Worker's Rights and Responsibilities

Supervisor's Responsibilities

Employer's Responsibilities

Formation of Joint Health and Safety Committee

Role of Joint Health and Safety Committee

Work Refusals

Workplace Hazardous Material Information System (WHMIS)

Hazard Symbols and Classes

2. US Occupational Health and Safety Legislation

General Outline

Duties of Employers

Duties of Employees

Key Provisions

Hazard Communication

Hazard Warning and Symbols

1. Canada

General Outline

The purpose of Occupational Health and Safety (OH&S) legislation is to protect you, the employee, against hazards on the job. It outlines the general rights and responsibilities of the employer, the supervisor and the employee.

The law makes both you and your employer jointly responsible for workplace health and safety legislation.

What does the OH&S legislation say?

Each of the provinces and the federal government have their own OH&S legislation. The details of the OH&S legislation vary slightly from one jurisdiction to another but the basic elements are the same.

Most Canadian jurisdictions have a *general duty provision* in their OH&S legislation which requires employers to take all reasonable precautions to protect the health and safety of employees.

1. Government's Responsibilities

- To enforce occupational health and safety legislation to conduct workplace inspections.
- To disseminate information.
- To promote training, education and research.

2. Employee Rights and Responsibilities

Employee Rights:

- to refuse unsafe work;
- to participate in workplace health and safety activities through the Joint Health and Safety Committee (JHSC) or an employee health and safety representative; and
- to know actual and potential dangers in the workplace.

Employee Responsibilities:

- to work in compliance with the OH&S act and regulations;
- to use personal protective equipment and clothing as directed by the employer; and
- to report workplace hazards and dangers.

3. Supervisor's Responsibilities

- To ensure that employees use prescribed protective equipment.
- To advise employees of potential and actual hazards.
- To take every reasonable precaution in the circumstances for the protection of employees.

4. Employer's Responsibilities

- To establish and maintain a joint health and safety committee, or cause employees to select at least one health and safety representative.
- To take every reasonable precaution to ensure the workplace is safe.
- To inform employees about any potential hazards and provide training to work safely.
- To provide personal protective equipment and ensure workers know how to use the equipment safely and properly.
- To immediately report all critical injuries to the government department responsible for OH&S.
- To train all employees on how to safely use, handle, store and dispose of hazardous substances and handle emergencies.

5. Joint Health and Safety Committee (JHSC)

- Must be composed of management and employee representatives.
- At least half the members of the committee must be employee representatives.
- Must meet at least once every 3 months; 1 month in some jurisdictions.
- Must be co-chaired by one management chairperson and one employee chairperson.
- Employee representatives are elected or selected by the employees or their union.

6. Role of the Joint Health and Safety Committee

- To act as an advisory body.
- To identify hazards and obtain information.
- To recommend corrective actions.
- To assist in resolving work refusal cases.
- To participate in accident investigations and workplace inspections.

7. Work Refusals

You can refuse work if you have reason to believe that the situation is unsafe to either yourself or your co-workers.

- You must report to your supervisor that you are refusing to work and state why you believe the situation is unsafe.
- You, your supervisor, and a JHSC member or employee representative will investigate.
- You return to work if the problem is resolved.
- If the problem is not resolved, a government health and safety representative is called.

- Your supervisor may assign you reasonable alternative work.
- The inspector will investigate the situation and give a decision.

Workplace Hazardous Materials Information System

WHMIS (Pronounced whimiss)

WHMIS applies to all Canadian workplaces. It requires that all workers who work with or near a hazardous substance (controlled product) be informed about its potential hazards and recommended safe work practices.

WHMIS requires that information be provided in three ways:

1. All controlled products used in the workplace must have a WHMIS label on the container.
2. Material Safety Data Sheets (MSDS) and hazard information must be readily available in the work place. A MSDS summarizes the health and safety information about the product.
3. Workers must receive training to be able to recognize and work safely with chemicals.

The **HAZARD SYMBOL** is an important part of the WHMIS label. It warns the user that a particular hazard exists.

Actual hazards from toxic substances depend on the amount (level and duration) of exposure. A brief exposure at high levels may result in chemical poisoning within hours. Prolonged exposure at low levels may cause illness after several years.

Hazard Symbols and Classes

	Class A **Compressed Gas**	Contents under high pressure. Cylinder may explode or burst when heated, dropped or damaged.
	Class B **Flammable and Combustible Material**	May catch on fire when exposed to heat, spark or flame. May burst into flames.
	Class C **Oxidizing Material**	May cause fire or explosion when in contact with wood, fuels and other combustible material.
	Class D, Division 1 **Poisonous and Infectious Material: immediate and serious toxic effects**	Poisonous substance. A single exposure may be fatal or cause serious or permanent damage to health.
	Class D, Division 2 **Poisonous and Infectious Material: other toxic effects**	Poisonous substance. May cause irritation. Repeated exposure may cause cancer, birth defects, or other permanent damage.
	Class D, Division 3 **Poisonous and Infectious Material: biohazardous infectious material**	May cause disease or serious illness. Drastic exposures may result in death.
	Class E **Corrosive Material**	Can cause burns to eyes, skin or respiratory system.
	Class F **Dangerously Reactive Material**	May react violently causing explosion, fire or release of toxic gases, when exposed to light, heat, vibration or extreme temperatures.

2. US Occupational Health and Safety Legislation

General Outline

In the United States of America (USA) the Occupational Safety and Health Act is popularly known as OSHAct. The Occupational Safety and Health Administration (OSHA) is responsible for administering the OSHAct.

The OSHAct does not cover the following four categories of people:

- self-employed persons;
- farms which employ only immediate family members of the farm employer;
- workers covered by other legislation; or
- state and local government employees.

Regulations dealing with OSHA are published in Title 29 of the Code of Federal Regulations as:

- 29 CFR Part 1910—Occupational Safety and Health Standards; and
- 29 CFR Part 1926—Construction Standards.

These standards define exposure limits, exposure monitoring methods, medical surveillance and protective measures.

Duties of Employers

The OSHAct sets out two main duties for employers:

- employers must provide a workplace which is free from hazards that are known to cause or likely to cause death or serious physical harm to employees; and
- employers must comply with occupational safety and health standards under the Act.

Duties of Employees

Employees must comply with occupational safety and health standards, rules, regulations and orders which are applicable to their own conduct and actions.

Key Provisions

Some of the key provisions of the OSHAct are to:

- assure, insofar as possible, that every employee has safe and healthy working conditions;
- require employers to maintain accurate records of exposures to potentially toxic materials or harmful physical agents and inform employees of the monitoring results;
- provide for employee walk-around or interview of employees during the inspection process; and
- provide procedures for investigating alleged violations, at the request of any employee or employee representatives, issuing citations and assessing monetary penalties against employers.

Hazard Communication

The intent of the OSHA Hazard Communication Standard is to provide employees with information and training about the potential health hazards from exposure to workplace chemicals. The Standard requires that employee training include:

- explanations of the requirements of the standard;
- identification of workplace operations where hazardous chemicals are present;
- knowledge of the methods and observations used to detect the presence of hazardous workplace chemicals;
- assessment of the physical and health hazards of those chemicals;

- warnings about hazards associated with chemicals in unlabelled pipes;
- descriptions of hazards associated with non-routine tasks;
- details about the measures employees can take to protect themselves against these hazards, including specific procedures;
- explanation of the labelling system;
- instructions on location and use of material safety data sheets (MSDSs); and
- details on the availability and location of the hazardous materials inventory, MSDSs, and other written hazard communication material.

Hazard Warning and Symbols

Chemicals produced in the USA come under OSHA Hazard Communication Standard. The label on the container must warn about potential hazards of the product. OSHA does not require hazard symbols on the label, however, the skull and crossbones symbol is acceptable on containers of highly toxic substances and the flame symbol is acceptable on containers of flammable substances.

Section V

Information Sources

1. Canadian Government Departments with Responsibility for Occupational Health and Safety
2. US Federal Safety and Health Agencies
3. State Occupational Safety and Health Plans

1. Canadian Government Departments Responsible for Occupational Health and Safety

Canadian Centre for Occupational Health and Safety (CCOHS)

Client Services
Phone: (905) 570-8094
Toll-free: 1-800-668-4284 (Canada and US only)
Fax: (905) 572-2206
E-mail: clientservices@ccohs.ca
Web Site: www.ccohs.ca

Inquiries Service
(free answers to your OH&S questions)
Phone: (905) 572-4400
Toll-free: 1-800-263-8466 (Canada only)
Fax: (905) 572-4500
E-mail: inquiries@ccohs.ca
OSH Answers Web Site: www.ccohs.ca/oshanswers

Federal Jurisdiction

Labour Program
Human Resources Development Canada
Ottawa ON K1A 0J2
Regional and District Offices
Web Site: http://www.hrdc-drhc.gc.ca/menu/profile-search.shtml

Provincial Jurisdictions

Alberta

Workplace Health and Safety
Alberta Human Resources and Employment
9940-106 Street
Edmonton, AB T5K 2N2
call centre: 1-866-415-8690
Fax: (780) 422-3730
E- mail: whs@gov.ab.ca
Web Site: www.gov.ab.ca/hre/whs/

British Columbia

Workers' Compensation Board of British Columbia
PO Box 5350 Stn Terminal
Vancouver, BC V6B 5L5
General Inquiries: (604) 273-2266
Toll-free: 1-800-661-2112
Fax: (604) 276-3247
Prevention Information Line
Phone: (604) 276-3100
Toll-free in B.C.: 1-888-621-7233 (SAFE)
Health and Safety Emergency Accident Reporting
Toll-free in B.C.: 1-888-621-7233 (SAFE)
After Hours Phone: 1-866-922-4357
Web Site: www.worksafebc.com

Manitoba

Workplace Safety and Health Division
Manitoba Labour
200-401 York Avenue
Winnipeg, MB R3C 0P8
General Inquiries: (204) 945-3446
Toll free in Manitoba: 1-800-282-8069
After hours: (204) 945-0581
Fax: (204) 945-4556
Web Site: www.gov.mb.ca/labour/safety/

New Brunswick

Workplace Health, Safety and Compensation Commission of New Brunswick
500 Beaverbrook Court
Fredericton, NB E3B 5X4
General Inquiries: (506) 453-2467
Toll-free in NB: 1-800-442-9776
E-mail: prevention@whsccnb.ca
Fax: (506) 453-7982
Web Site: www.whscc.nb.ca/

Newfoundland and Labrador Department of Labour
Confederation Building, 4th Floor, West Block
PO Box 8700
St. John's, NF A1B 4J6
General Inquiries: (709) 729-7420
Toll-free in NF: 1-800-563-5471
Fax: (709) 729-3445
Web Site: www.gov.nf.ca/labour/

Northwest Territories and Nunavut

Workers' Compensation Board of Northwest Territories and Nunavut
PO Box 8888
Yellowknife, NT X1A 2R3
General Inquiries: (867) 920-3888
Toll free: 1-800-661-0792
Fax: (867) 873-4596
E-mail: yellowknife@wcb.nt.ca
Web Site: http://www.wcb.nt.ca/home.htm

Nova Scotia

Nova Scotia Department of Environment and Labour Occupational Health and Safety Division
5151 Terminal Rd., 6th Floor
PO Box 697
Halifax, NS B3J 2T8
General Inquiries: (902) 424-5400
Toll free in NS: 1-800-952-2687

Fax: (902) 424-3239
E-mail: labrohs@gov.ns.ca
Web Site: http://www.gov.ns.ca/enla/ohs/

Ontario

Ministry of Labour
Occupational Health and Safety Branch
655 Bay St., 14th Floor
Toronto, ON M7A 1T7
General Inquiries: (416) 326-7770
Toll free in Ontario: 1-800-268-8013
Fax: (416) 326-7761
E-mail: webohs@mol.gov.on.ca
Web Site: www.gov.on.ca/LAB/main.htm

Prince Edward Island

Workers' Compensation Board of PEI
Occupational Health and Safety Division
PO Box 757, 14 Weymouth Street
Charlottetown, PE C1A 7L7
General Inquiries: (902) 368-5680
Toll-free in PEI: 1-800-237-5049
Fax: (902) 368-5705
Web Site: www.wcb.pe.ca

Québec

Commission de la santé et de la sécurité du travail du Québec (CSST) (Occupational Health & Safety Commission)
CP 6056, succursale Centre-ville
Montréal, PQ H3C 4E1
Phone: (514) 906-3060
Toll-free in PQ: 1-800-667-7585
Fax: (514) 906-3062
Web Site: www.csst.qc.ca

Saskatchewan

Saskatchewan Labour
Occupational Health and Safety Division
1870 Albert Street
Regina, SK S4P 3V7
General Inquiries: (306) 787-4496
Toll-free in SK: 1-800-567-7233
Fax: (306) 787-2208
Web Site: www.labour.gov.sk.ca/
Saskatoon Office:
Phone: (306) 933-5042
Toll-free: 1-800-667-5023
Fax: (306) 933-7339

Yukon Territory

Yukon Workers' Compensation, Health and Safety Board, Occupational Health and Safety Branch
401 Strickland Street
Whitehorse, YT Y1A 5N8
General Inquiries: (867) 667-5645
Toll free in the Yukon: 1-800-661-0443
Fax: (867) 393-6279
Web Site: http://www.wcb.yk.ca

For an up-to-date listing of information sources visit http://www.ccohs.ca/oshanswers/information/govt.html

2. US Federal Safety and Health Agencies

US Environmental Protection Agency (EPA)

Ariel Rios Building
1200 Pennsylvania Avenue N.W.
Washington, DC 20460
Phone: (202) 260-2090
International Requests Fax: (202) 566-0544
Toll-free: 1-800-424-9346
Web Site: www.epa.gov

National Institute for Occupational Safety and Health (NIOSH)

4676 Columbia Parkway
Cincinnati, OH 45226
Publications Dissemination
Phone: (513) 533-8471
Fax: (573) 533-8573
Toll-free in the US: 1-800-35-NIOSH
(1-800-356-4674)
Outside the US: (513) 533-8328
E-mail: eidtechinfo@cdc.gov
Web Site: www.cdc.gov/NIOSH/homepage.html

Occupational Safety & Health Administration (OSHA)

200 Constitution Ave., NW
Washington, DC 20210
Phone: (202) 693-2000
Toll free: 1-800-321-OSHA (Emergency reporting)
Web Site: www.osha.gov
A listing of the Regional Offices follows:

OSHA Regional Offices

Region 1: Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont, US Dept. of Labor—OSHA
JFK Federal Building, Room E340
Boston, MA 02203
Phone: (617) 565-9860
Fax: (617) 565-9827
Web Site: www.osha.gov/oshdir/r01.html

Region 2: New Jersey, New York, and Puerto Rico, Virgin Islands, USA Dept. of Labor — OSHA
201 Varick St., Rm. 670
New York, NY 10014
Phone: (212) 337-2378
Fax: (212) 337-2371
Web Site: www.osha.gov/oshdir/r02.html

Region 3: District of Columbia, Delaware, Maryland, Pennsylvania, Virginia and West Virginia, USA Dept. of Labor — OSHA
The Curtis Center-Suite 740 West
170 S. Independence Mall West
Philadelphia, PA 19106-3309
Phone: (215) 861-4900
Fax: (215) 861-4904
Web Site: www.osha.gov/oshdir/r03.html

Region 4: Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee, USA Dept. of Labor — OSHA
61 Forsyth St. SW
Atlanta, Georgia 30303
Phone: (404) 562-2300
Fax: (404) 562-2295
Web Site: www.osha.vog/oshdir/r04.html

Region 5: Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin, USA Dept. of Labor — OSHA
230 South Dearborn St., Rm. 3244
Chicago, IL 60604
Phone: (312) 353-2220
Fax: (312) 353-7774
Web Site: www.osha.gov/oshdir/r05.html

Region 6: Arkansas, Louisiana, New Mexico, Oklahoma, and Texas, USA Dept. of Labor—OSHA
525 Griffin St., Rm. 602
Dallas, TX 75202
Phone: (214) 767-4731
Fax: (214) 767-4693
Web Site: www.osha.gov/oshdir/r06.html

Region 7: Iowa, Kansas, Missouri, and Nebraska, USA Dept. of Labor—OSHA
City Center Square
1100 Main St., Suite 800
Kansas City, MO 64105
Phone: (816) 426-5861
Fax: (816) 426-2750
Web Site: www.osha.gov/oshdir/r07.html

Region 8: Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming, USA Dept. of Labor—OSHA
1999 Broadway, Suite 1690
P.O. Box 46550
Denver, CO 80202-6550
Phone: (303) 844-1600
Fax: (303) 844-1616
Web Site: www.osha.gov/oshdir/r08.html

Region 9: Samoa, Arizona, California, Guam, Hawaii, Nevada, and Trust Territory of the Pacific Islands, USA Dept. of Labor—OSHA
71 Stevenson Street St.
4th Floor, Suite 420
San Francisco, CA 94105
Phone: (415) 975-4310
Fax: (415) 975-4319
Web Site: www.osha.gov/oshdir/r09.html

Region 10: Alaska, Idaho, Oregon, Washington, USA Dept. of Labor—OSHA
1111 Third Avenue, Suite 715
Seattle, Washington 98101-3212
Phone: (206) 553-5930
Fax: (206) 553-6499
Web Site: www.osha.gov/oshdir/r10.html

3. State Occupational Safety and Health Plans

Alaska

Alaska Department of Labor
P.O. Box 21149
Juneau, Alaska 99801-1149
Physical location
1111 W. 8th Street, Room 304
Juneau, Alaska 99801-1149
Web Site: www.labor.state.ak.us/lss/lss.htm

Arizona

Industrial Commission of Arizona
800 W. Washington
Phoenix, Arizona 85007-2922
Telephone: (602) 542-4411
(602) 542-5795
Fax: (602) 542-1614
Web Site: http://www.ica.state.az.us/ADOSH/oshatop.htm

California

California Department of Industrial Relations
455 Golden Gate Avenue - 10th Floor
San Francisco, California 94102
Telephone: (415) 703-5050
Fax: (415) 703-5114
Web Site: http://www.dir.ca.gov/occupational_safety.html

Connecticut

Connecticut Department of Labor
Consultation Services
Division of Occupational Safety and Health
38 Wolcott Hill Road
Wethersfield, Connecticut 06109
Telephone: (860) 566-4550
Fax: (860) 566-6916
Web Site: http://www.ctdol.state.ct.us/osha/osha.htm

Hawaii

Hawaii Department of Labor and Industrial Relations
Consultation and Training Branch
830 Punchbowl Street
Honolulu, Hawaii 96813
Telephone: (808) 586-9100
Fax: (808) 586-9104
Web Site: http://www.state.hi.us/dlir/hiosh/

Indiana

Indiana Department of Labor
Bureau of Safety, Education and Training
Division of Labor, Room W195
402 West Washington
Indianapolis, Indiana 46204-2287
Telephone: (317) 232-2688
Fax: (317) 232-3790
Web Site: http://www.state.in.us/labor/iosha/iosha.html

Iowa

Iowa Division of Labor Services
Consultation Program
1000 E. Grand Avenue
Des Moines, Iowa 50319-0209
Telephone: (515) 281-7629 Consultation
Telephone: (515) 281-0202 Education
Fax: (515) 281-5522
Web Site: http://www.state.ia.us/iwd/labor/ index.html

Kentucky

Kentucky Labor Cabinet
1047 U.S. Highway 127 South, Suite 4
Frankfort, Kentucky 40601
OSH Division of Compliance
Telephone: (502) 564-3070 ext. 305
Fax: (502) 564-4769
OSH Division of Education and Training
Telephone: (502) 564-3070 ext. 266

Fax: (502) 564-4769 FAX
Web Site: http://www.kylabor.net/kyosh/index.htm

Maryland

Maryland Department of Labor, Licensing and Regulation
1100 North Eutaw Street, Room 613
Baltimore, Maryland 21201-2206
Maryland Occupational Safety & Health (MOSH)
Telephone: (410) 767-2215
Fax: (410) 333-7747
Web Site: http://www.dllr.state.md.us/labor/mosh.html

Michigan

Michigan Department of Consumer and Industry Services, Bureau of Safety and Regulation
7150 Harris Drive
P.O. Box 30643
Lansing, Michigan 48909-8143
Telephone: (517) 322-1814
Fax: (517) 322-1775
Web Site: http://www.cis.state.mi.us/bsr/

Minnesota

Minnesota Department of Labor and Industry
443 Lafayette Road North
St. Paul, Minnesota 55155-4307
Telephone: (651) 284-5050
Fax: (651) 297-1953
Internet: http://www.doli.state.mn.us/wsc.html

Nevada

Nevada Division of Industrial Relations Occupational Safety and Health Enforcement Section (OSHES)
1301 N. Green Valley Parkway – Suite 200
Henderson, Nevada 89014
Safety Consultation and Training Section
Phone: 702-486-9140
Fax: 702-990-0362
Web Site: http://dirweb.state.nv.us

New Jersey

New Jersey Department of Labor
Division of Public Safety and Occupational Safety and Health
225 E. State Street
8th Floor West
P.O. Box 953
Trenton, New Jersey 08625-0953
Telephone: (609) 292-3923
Fax: (609) 292-4409
Consultation Web Page:
http://www.state.nj.us/labor/wps/psosh/onsite/onsite.htm
New Jersey State OSH Plan Web Page:
http://www.state.nj.us/labor/isse/ispcosh.html

New Mexico

New Mexico Environment Department
Occupational Health and Safety Bureau
525 Camino de Los Marquez, Suite 3
PO Box 26110
Santa Fe, New Mexico 87502
Telephone: (505) 827-4230
Fax: (505) 827-4422
Web Site: www.nmenv.state.nm.us/OHSBwebsite/ohsb-home-htm

New York

New York Department of Labor
W. Averell Harriman State Office Building–12
Room 500
Albany, New York 12240
New York On-Site Consultation Program
State Office Campus Building 12, Room 168
Albany, New York 12240
Telephone: (518) 457-2238
Fax: (518) 457-3454
Web site: http://www.labor.state.ny.us/working_ny/worker_rights/safety_health.html?

North Carolina

North Carolina Department of Labor (NCDOL)
4 West Edenton Street
Raleigh, North Carolina 27601-1092
Bureau of Consultative Services
Telephone: (919) 807-2899
Fax: (919) 807-2902
Web site: http://www.nclabor.com/osha/osh.htm

Oregon

Oregon Occupational Safety and Health Division
Department of Consumer & Business Services
350 Winter Street, NE, Room 430
Salem, Oregon 97310
Telephone: (503) 378-3272
Toll-free in Oregon: (800) 922-2689
Web site: http://www.orosha.org/

Puerto Rico

Puerto Rico Department of Labor
and Human Resources
Occupational Safety and Health Office
Department of Labor and Human Resources
20th Floor
505 Muñoz Rivera Avenue
Hato Rey, Puerto Rico 00918
Telephone: (787) 756-1100, 1106
Fax: (787) 767-6051
Web site: http://dtrh.prstar.net/

South Carolina

South Carolina Department of Labor, Licensing and
Regulation
Office of OSHA Compliance
3600 Forest Drive
PO Box 11329
Columbia, South Carolina 29204
Telephone: (803) 734-9644
Fax: (803) 734-9772
Web site: http://www.llr.state.sc.us/osha.asp

Tennesse

Tennessee Department of Labor and Workforce Development
OSHA Consultative Services
Tennessee Department of Labor and Workforce Development
710 James Robertson Parkway, 3rd Floor
Nashville, Tennessee 37243-0659
Telephone: (615) 741-7036
Fax: (615) 532-2997
Web site: http://www.state.tn.us/labor-wfd

Utah

Utah Labor Commission
Consultation Services
160 East 300 South, 3rd Floor
Salt Lake City, Utah 84114-6650
Telephone: (801) 530-6901
Fax: (801) 530-6992
Web site: http://www.labor.state.ut.us/ Utah_Occupational_Safety___Hea/utah_occupational_safety___hea.htm

Vermont

Vermont Department of Labor and Industry
Division of Occupational Safety & Health
National Life Building, Drawer 20
National Life Drive
Montpelier, Vermont 05602-3401
Telephone: (802) 828-2765
Fax: (802) 828-2748
Web site: http://www.state.vt.us/labind/vosha.htm

Virginia

Virginia Department of Labor and Industry
Powers-Taylor Building
13 South 13th Street
Richmond, Virginia 23219
Telephone: (804) 786-2377
Fax: (804) 371-6524
Web site: http://doli.state.va.us/

Virgin Islands

Virgin Islands Department of Labor
Division of Occupational Safety and Health
3021 Golden Rock
Christiansted, St. Croix, Virgin Island 00840
Telephone: (340) 772-1315
Fax: (340) 772-4323

Washington

Washington Department of Labor and Industries
PO Box 44001
Olympia, Washington 98504-4001
Telephone : (360) 902-4200
Fax: (360) 902-4202
Web site: http://www.lni.wa.gov/wisha/default.htm

Wyoming

Wyoming Department of Employment
Workers' Safety and Compensation Division
Cheyenne Business Center
1510 East Pershing Blvd.
Cheyenne, Wyoming 82002
Telephone: (307) 777-7786
Fax: (307) 777-3646
Web site: http://wydoe.state.wy.us/doe.asp?ID=7

Appendices

A1. Sample Ergonomics Survey Questionnaire

A2. Sample Health Survey

A3. Sample Ergonomic Checklist

In this section examples of questionnaires and checklists are given to help identify potential ergonomic problems in the workplace.

Caution USE these questionnaires and checklists in consultation with an expert.

SELECT a checklist that suits the objectives of your study.

CUSTOMIZE these questionnaires and checklists to address workplace conditions and work practices applicable to your workplace.

ANALYZE the response to questionnaires and checklists in consultation with an expert.

Appendix A1

Sample Ergonomics Survey Questionnaire

(used by CCOHS)

Name *(Optional)*:_____

Introduction

The purpose of this survey is to analyze the ergonomic needs of staff based on existing health concerns and ergonomic standards. These needs should be carefully studied and prioritized by the Health and Safety Committee. Recommendations for remedial action should be made to Senior Management.

The entire questionnaire must be filled out carefully and submitted to the co-chairpersons of the health and safety committee. All individual surveys should be regarded as CONFIDENTIAL.

Background Information

1. What percentage of your time is spent:

   sitting _____

   standing _____

   walking _____

   operating a VDT _____

2. If you operate a VDT:

   a. How many years have you worked on a VDT?

   _____

   b. How many hours a day do you work on a VDT?

   _____

   c. How many days per week?

   _____

   d. Are there non-VDT tasks included in your job?

   _____

   e. Do you take your relief breaks (5 minutes each hour)?

3. Do you have a variety of tasks that take you away from your desk/workstation periodically?

☐ **Yes** ☐ **No**

4. What is your age? 15 - 19
20 - 29
30 - 39
40 - 49
50 - 59
60 +

5. Are you right-handed or left-handed, or both?
(check one) ☐ Right ☐ Left ☐ Both

6. In the last year have you had pain or discomfort that has lasted two days or more in your:

Neck	☐ **Yes**	☐ **No**
Shoulder	☐ **Yes**	☐ **No**
Elbow	☐ **Yes**	☐ **No**
Wrist/forearm	☐ **Yes**	☐ **No**
Hand	☐ **Yes**	☐ **No**
Upper back	☐ **Yes**	☐ **No**
Lower back	☐ **Yes**	☐ **No**
Foot	☐ **Yes**	☐ **No**

7. Rate the pain or discomfort: *(please duplicate this page if more than one part of the body is involved)*

at work	☐ goes away	☐ stays same	☐ becomes worse
after work	☐ goes away	☐ stays same	☐ becomes worse
after a week away from work	☐ goes away	☐ stays same	☐ becomes worse

8. Altogether, how much does your pain or discomfort interfere with your work, your life outside work and your sleep? Please mark the scales with an "✗".

For example	1	5	✗	10
	None	Moderate		Very intense

How much does it interfere with your work?

1	5	10
No Interference		Had to take time off work

How much does it interfere with your life outside of work?

1	5	10
No Interference		Had to stop an activity outside of work

How much does it interfere with your sleep?

1	5	10
No Interference		It affects you every night

9. Can you relate the pain to any particular work/task?

10. How do you feel after work?

1	5	10
Invigorated	Normal	Burned out exhausted

11. Has your doctor diagnosed any type of musculoskeletal injury? *For example:*

carpal tunnel syndrome ☐ **Yes** ☐ **No**

tendonitis ☐ **Yes** ☐ **No**

low back problem ☐ **Yes** ☐ **No**

☐ other musculoskeletal problem

Please describe: _____

_____

12. Do you think this injury is:

a. caused by your work ☐ **Yes** ☐ **No**

b. made worse by your work ☐ **Yes** ☐ **No**

13. Are you using any type of arm/wrist, splint or brace as treatment for the above injury? ☐ **Yes** ☐ **No**

14. Are you undergoing physical therapy for the above injury? Please explain.

_____

_____

_____

_____

_____

15. Do you have any of the following in your feet or legs when sitting at your desk/workstation?

Pain	☐ **Yes**	☐ **No**
Numbness	☐ **Yes**	☐ **No**
Tingling	☐ **Yes**	☐ **No**
Swelling	☐ **Yes**	☐ **No**

16. Do these symptoms continue after working hours?

☐ **Yes** ☐ **No**

17. Do you have varicose veins?

☐ **Yes** ☐ **No**

18. Do you have eye discomfort e.g., blurring, itchiness, redness, watering?

☐ **Yes** ☐ **No**

If YES, please describe:

_____

_____

_____

_____

_____

19. When were your eyes last checked?_____

_____

20. Do you wear eyeglasses?

☐ **Yes** ☐ **No**

21. Do you wear contact lenses?

☐ **Yes** ☐ **No**

22. If you operate a VDT, have you made your optometrist/opthamologist aware of this?

☐ **Yes** ☐ **No**

23. Do you get headaches?

☐ **Yes** ☐ **No**

If YES, how often_____

24. Please provide any other comments on how your work area affects your health.

_____

_____

_____

_____

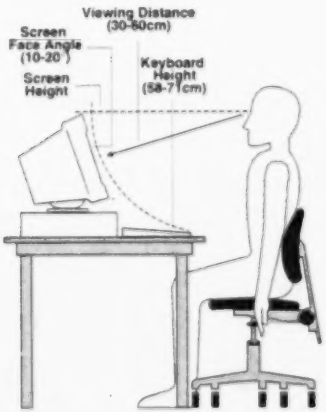
_____

Workstation Inventory

Please answer the following as they apply to you.

VDT

Do you have the following:	Yes	No	Don't Know
25. Shared workstation	___	___	___
26. Detached and moveable keyboard	___	___	___
27. Anti-glare filter/screen	___	___	___
28. Top of VDT screen at about eye level	___	___	___
29. Viewing distance between 30-60 cm	___	___	___
30. Sharp, easy to read images on VDT screen that do not flicker	___	___	___
31. Adjustable document holder	___	___	___



Chair

	Yes	No	Don't Know
32. Adjustable chair?	___	___	___
33. Chair that is easy to adjust?	___	___	___
34. Comfortable back support?	___	___	___
35. Wheels/castors on your chair that work properly?	___	___	___
36. Footrest?	___	___	___
37. Armrests that do not block chair from getting close to work surface?	___	___	___
38. Feet resting flat on the floor while sitting with no pressure on back of legs?	___	___	___

39. How old is your chair? ___ Years

Work Area

40. Adjustable work surface height?	___	___	___
41. VDT placed on a standard desk?	___	___	___
42. Adequate space under work surface to allow changes in leg position without getting up?	___	___	___
43. Adequate work surface to hold your work materials?	___	___	___
44. Ability to move around freely without excessive bending, twisting or bumping into obstacles?	___	___	___

Visual Environment

	Yes	No	Don't Know
45. Enough light?	___	___	___
46 Too much light?	___	___	___
47. Shadows?	___	___	___
48. Adjustable task lamp?	___	___	___
49. Glare directly from overhead lighting?	___	___	___
50. Glare from your VDT screen?	___	___	___
51. Light reflecting back at you from any other shiny surface?	___	___	___

If YES, from where? _____

_____

52. Curtains or blinds on windows?	___	___	___
53. Special filter on ceiling lights?	___	___	___

54. Do you have any suggestions on how to improve your work area?

_____

_____

_____

_____

_____

Appendix A2

Sample Health Survey

1. What is your present job description?

_____

_____

_____

2. How long have you been employed at your present job?

_____

3. In the last year, have you had pain or discomfort that lasted 2 days or more?

Neck	☐ **Yes**	☐ **No**
Shoulder	☐ **Yes**	☐ **No**
Elbow	☐ **Yes**	☐ **No**
Wrist/forearm	☐ **Yes**	☐ **No**
Hand	☐ **Yes**	☐ **No**
Upper back	☐ **Yes**	☐ **No**
Lower back	☐ **Yes**	☐ **No**
Foot	☐ **Yes**	☐ **No**

If you answered "no" to these questions, stop here.

4. At work is the pain or discomfort? ☐ better ☐ same ☐ worse

5. After your shift, is the pain or discomfort? ☐ better ☐ same ☐ worse

6. After a week away from work, is the pain of discomfort? ☐ better ☐ same ☐ worse

7. Did the pain or discomfort cause you to take time off work? ☐ **Yes** ☐ **No**

8. Altogether, how much does your pain or discomfort interfere with your work, your life outside of work, and your sleep? Please mark off on these scales with an "X".

For example	1	X 5	10
	None	Moderate	Very intense

How much does it interfere with your work?

1	5	10
No Interference		Had to take time off work

How much does it interfere with your life outside of work?

1	5	10
No Interference		Had to stop an activity outside of work

How much does it interfere with your sleep?

1	5	10
No Interference		It affects you every night

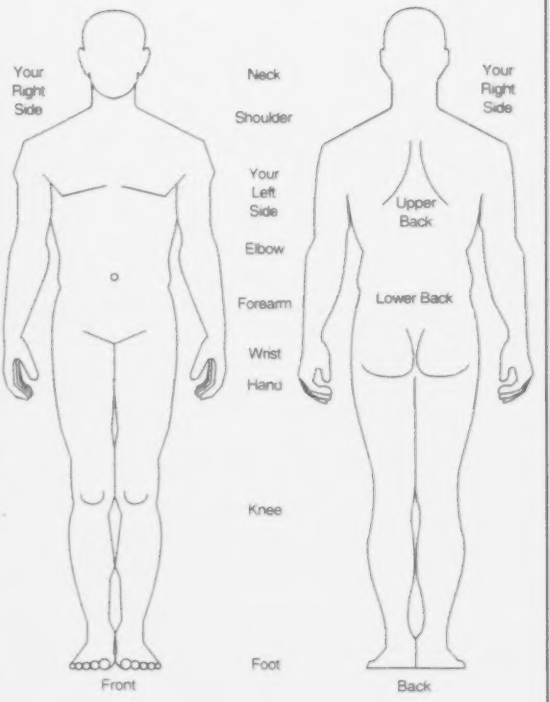
9. What is your sex? ☐ Male ☐ Female

10. How old are you? _____ years

11. Are you right-handed, left-handed, or both?

☐ Right-handed ☐ Left-handed ☐ Both

* *Taken from a report prepared by CCOHS staff for the Government of Newfoundland*



12. In this diagram the body parts are shown approximately. This is a guide to help you tell us where your pain or discomfort is located (if any). Please shade in the areas that bother you.

13. Please make any comments or suggestion about how work affects you an how to correct any problems in the workplace.

Appendix A3

Sample Ergonomic Checklist

1. Work Organization

1.1	Does the person have a variety of tasks in a work day?	☐ Yes	☐ No
	If YES, does the person have some control over the order in which the tasks are done?	☐ Yes	☐ No
1.2	Does the person consider that the work rates are within his or her capacity?	☐ Yes	☐ No
	If NO, have they been reviewed recently?	☐ Yes	☐ No
1.3	Does the person have any control over the pace of work?	☐ Yes	☐ No
1.4	Are work cycles of a reasonable length so that work is not highly repetitious?	☐ Yes	☐ No
1.5	Is the workload reasonably constant?	☐ Yes	☐ No
1.6	Does the person work a standard working week?	☐ Yes	☐ No
1.7	Is pay based on a flat wage? (If bonus or incentive schemes are in operation, is the speed of production the sole criterion?)	☐ Yes	☐ No
1.8	Have work pauses been taken as appropriate?	☐ Yes	☐ No
1.9	If the person is a new staff member, or has returned recently from leave, did he or she have a period to adjust to the workload?	☐ Yes	☐ No
1.10	Does the person have any opportunity to participate in decision-making relevant to his or her work?	☐ Yes	☐ No

2. Workplace Design

Work Posture

2.1 Does the person have the choice to sit or stand at the work area? ☐ Yes ☐ No

2.2 Is there enough space to allow freedom of movement at the work area? (For example, when the person is seated, there should be enough space to move or stretch out legs.) ☐ Yes ☐ No

Standing

If the person is required to stand while working, the following questions are relevant:

2.3 Is a footrest available? ☐ Yes ☐ No

2.4 Is the floor surface appropriate? ☐ Yes ☐ No

2.5 Is a chair or stool provided? ☐ Yes ☐ No

Sitting

If the person is required to sit while working, the following questions are relevant:

2.6 Does the person find the seat comfortable? ☐ Yes ☐ No

2.7 Is it easy for the person to get into and out of the chair? ☐ Yes ☐ No

2.8 Does the seat height allow correct positioning of the legs? (The person's thighs should be parallel to the floor with the feet resting on the floor or on a footrest). ☐ Yes ☐ No

2.9 Does the backrest adequately support the lumbar area? ☐ Yes ☐ No

Work Level Height

2.10 If the task requires considerable strength and/or a wide range of arm movements, is the work level slightly below the elbows? ☐ Yes ☐ No

2.11 If the task requires precision, such as in the assembly of electronic equipment, is the work level slightly above the elbows? ☐ Yes ☐ No

Work Layout

2.12 Can most of the work be performed with the upper arms in relaxed position close to the body? ☐ Yes ☐ No

2.13 Are all frequently handled items within easy reach? ☐ Yes ☐ No

2.14 Is the work area designed to prevent undue bending and/or twisting of the neck or trunk? ☐ Yes ☐ No

2.15 Are displays easily read from the person's usual work position? ☐ Yes ☐ No

2.16 Are frequently used and important controls within easy reach? ☐ Yes ☐ No

2.17 Are controls easily grasped and operated? ☐ Yes ☐ No

Work Tools

2.18 Are the work tools appropriate for the tasks? ☐ Yes ☐ No

2.19 Do tool handles fit comfortably in the person's hands? (Consider shape, circumference, length, texture.) ☐ Yes ☐ No

2.20 During use, does each hand tool allow the person to keep his or her wrist in a neutral position? ☐ Yes ☐ No

2.21 Are the hand tools light-weight and balanced? ☐ Yes ☐ No

2.22 Are excessive grip strengths and grip spans avoided? ☐ Yes ☐ No

2.23 Is excessive vibration from hand-held power tools avoided? ☐ **Yes** ☐ **No**

2.24 Are balancers used to suspend power tools where appropriate? ☐ **Yes** ☐ **No**

2.25 Are work tools maintained in good condition? ☐ **Yes** ☐ **No**

Physical Work Environment

2.26 Does the person find the lighting satisfactory? ☐ **Yes** ☐ **No**

2.27 Does the person find the noise levels acceptable? ☐ **Yes** ☐ **No**

2.28 Does the person find the temperature and airflow in the workplace comfortable? ☐ **Yes** ☐ **No**

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